Ghana: Qualitative study on Innovation in Manufacturing Small and Medium Sized Enterprises (SMEs)

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Qualitative Study on Innovation in Manufacturing Small and Medium-Sized enterprises (SMEs) in Ghana

Exploration of Policy and Research Issues

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This report is written within the framework of the DFID-funded research project '*Enabling Innovation and Productivity Growth in Low Income Countries' (EIP-LIC)* implemented by Tilburg University in collaboration with Dutch, African and Asian academic partners. The content of the report is based on data collected during a working visit to Ghana from 20 to 30 September 2015, which comprised 17 in-depth interviews with small and medium-sized enterprises (SMEs) in Accra and Tema.

I would like to thank the enterprise owners and managers who gave up their time and were willing to talk and share their perceptions of daily realities, their stories and views with us. I thank my research partners of the University of Ghana, in particular Dr. William Baah-Boateng and Dr. Michael Danquah. A special thanks to Mr. Enock Kofi Anku, who organised and transcribed the interviews, and to Mr. Kwame Adjei-Mantey for driving us safely around. I also thank Marijke Bos, PhD candidate in Tilburg University, for her active involvement in the interviewing and sharing her reflections and ideas. The research work was prepared with valuable inputs from researchers of the 'Innovation Systems' and the 'Finance for Productivity Growth' teams of the DFID project.

Jaap Voeten (Tilburg University)

Contents

Introduction

The promotion of innovation in Low Income Countries (LICs) has recently appeared on the agenda of policy-makers and international development agencies. Many agree that innovation is crucial in these countries, because it is fundamental for growth in order to catch up with middle and high income economies (Chaminade et al., 2010). Current research, theory development and policy formulation to promote innovation, however, have mainly focused on innovation in the more advanced economies, whilst investigation of these issues in low income countries to date has been limited.

The 5-year research project *'Enabling Productivity and Innovation in Low Income Countries, (EIP-LIC)*' funded by the British Department for International Development (DFID) and commissioned to Tilburg University, aims to fill research gaps on innovation in LICs from an economic perspective. EIP-LIC aims to deliver robust high quality evidence from Africa and Asia on how to increase innovation and raise productivity in manufacturing SMEs, through a coordinated set of thematic and country case studies providing internationally comparable data. The countries of study include Kenya, Tanzania, South Africa, Ghana, Ethiopia, Uganda, Vietnam, Indonesia, India and Bangladesh.

EIP-LIC focuses on manufacturing Small and Medium-sized Enterprises (SMEs) in LICs. Promoting innovation in these enterprises has a particularly positive impact on development (Szirmai et al., 2011); SMEs are usually operating on the edge of the formal and informal sector and have low levels of productivity and competitiveness. Compared to the agriculture and services sectors, manufacturing in LICs is typically characterised by a limited share of the total GDP. Innovation within SMEs in manufacturing enables these enterprises to raise productivity and grow, resulting in a better-balanced economic structure while generating employment opportunities for poorer groups and contributing to poverty reduction. Moreover, promoting innovation in domestic manufacturing is a way towards import substitution and increases the competitive (export) position of firms on the world market.

One part of the project concerns a quantitative analysis of the internal and external factors of the innovation process within firms in all countries of study. Another part concerns a complementary qualitative exploration of the policy and research issues in each country. This involves the development of a series of case studies of manufacturing SMEs. The research output of qualitative reports, working papers and policy briefs are available at the EIP-LIC's website: http://www.tilburguniversity.edu/ dfid-innovation-and-growth/)

This report presents the findings of the qualitative exploration in Ghana. It is targeted at the DFID project researchers as well as the broader academic community with similar research interests in providing ideas or supporting them to identify and/or validate research questions and hypotheses. The report may also serve as reference material for reflecting and interpreting the outcomes of quantitative research in this area. In addition, it may provide useful bottom-up insights to policy makers within governmental agencies, firms and NGOs on innovation involving the entrepreneurs' perspective. It is also targeted at SME owners and SME branch organisations, who will hopefully see their business, socio-economic and institutional context reality accurately reflected in the report.

The structure of the qualitative exploration reports is the same for all countries in EIP-LIC, enabling cross-country comparison of the research and policy issues. Thus chapter 1 is standard for every report, outlining the DFID project research challenges, approach and methodology. Chapter 2, by contrast, focuses on the country of study only and briefly summarises latest trends in the manufacturing sector from secondary sources. Chapter 3 constitutes the main part of the report and provides the original primary qualitative data (cases) and analysis with regard to innovation in manufacturing SMEs in Ghana. Chapter 4 of the report concludes with analysis of the data and the identification of policy and research issues with special reference to the 'Innovation Systems' and 'Finance for Productivity Growth' research themes of the project.

1. DFID research project challenges

1.1 Approach: complementing quantitative with qualitative research

EIP-LIC aims to deliver robust high quality evidence from Africa and Asia on how to increase innovation in manufacturing SMEs so as to raise productivity, through a coordinated set of thematic and country case studies providing internationally comparable data. The project takes an econometric approach within two thematic areas: 'Innovation Systems' and 'Finance for Productivity Growth'. The research teams address internal capabilities and external institutional factors, institutions and policies that support or hinder the diffusion and adoption of innovation and finance raising productivity at SME firm level. Specifically, the project takes an 'economics' perspective on innovation, and involves econometric analysis of a set of variables concerning barriers at firm, regional and national levels and their causalities with the *innovative behaviour/capability of entrepreneurs* and subsequently innovation and productivity. This constitutes a reductionist and deductive approach in defining variables for analysis in which the impact of individual factors on innovation is assessed by applying quantitative econometric methods (ceteris paribus). The research methods include firm-level surveys in all countries of study (in cooperation with The World Bank), experiments and Randomised Control Trials (RCTs). The quantitative analysis will serve as a basis for identifying relationships between internal capabilities, external institutional factors and finance on the one hand and innovativeness and productivity growth on the other.

Applying quantitative methods in development research brings some limitations and challenges. In EIP-LIC too, conceptual issues emerged, in terms of the definition and measurement of innovation and productivity in LICs. These may seem straightforward variables at first glance, but their measurement can be more complicated in the LIC context. Innovation may be manifested differently, not via high profile technological and radical breakthroughs, usually measured by R&D expenditures or patents (OECD, 2005), but by more incremental adoption and adaptation or new combinations of existing technologies (Szirmai et al., 2011). These forms of innovation are equally important for raising productivity and competitiveness of SMEs in LICs.

Moreover, innovation research and theory development in recent decades has typically involved empirical material from advanced economies, such as the innovation systems literature of Lundvall (1992) and Freeman (1987), where innovation takes place within a relatively stable institutional and Science, Technology and Innovation (STI) policy context and is 'controlled' and supported by established innovation system actors and innovation policies. In LICs, however, the contemporary institutional realities and formal/informal dual economic contexts are different and may involve other less visible or less commonly known factors and policies around SMEs affecting their innovativeness and how innovation manifests itself.

Therefore, the theory and associated policies of how innovation evolves within an innovation system in the institutional contexts in LICs may be different, which is increasingly acknowledged in recent innovation systems literature (Lundvall, 2009; World Bank, 2010). For instance, entrepreneurs are innovating by Doing, Using and Interacting (DUI) in fast-changing contexts, enabled by informal institutions and informal (social) learning. Applying the research variables on innovation and productivity in LICs from existing literature and theory (deduction) based on advanced economies, therefore, might not take all relevant variables into account. A more precise identification of variables might be obtained by complementing the selection with a broader understanding of contemporary realities and context on the ground in LICs.

Another research challenge in EIP-LIC concerns the interpretation of the quantitative survey research outcomes of the project, involving cross sectional analyses amongst others, where attribution and explanatory issues among independent and dependent variables arise. Although control variables are typically verified, the correlations cannot be easily translated into causalities in complex and dynamic contexts. This is

particularly important for the interpretation of research outcomes at the policy level in the realities of the country concerned. A broader insight into how innovation processes and actor interaction mechanisms evolve might help to open the black box and analyse and interpret the quantitative outcomes.

In an effort to manage these challenges, EIP-LIC includes complementary qualitative research, involving an exploration and description of contemporary realities of innovation in manufacturing SMEs in the LICs. This aims at inductively identifying actual and relevant *research and policy issues* as input for the EIP-LIC research themes as well as for additional explanatory evidence supporting research output.

In operational terms, Tilburg University and partners conducted a series of case studies of manufacturing SMEs in each of the 10 target countries of study in the project. The holistic case study approach and method involves interviews capturing original insights, views and perceptions of SME owners and managers. Similar report format and comparable data will be used for all countries of study in EIP-LIC, enabling cross-country comparison to identify overall trends and patterns in innovation and productivity policy and research issues in manufacturing SMEs in LICs.

1.2 Case study methodology

The objective of the qualitative study of EIP-LIC is to identify relevant policy and research issues concerning innovation in manufacturing SMEs within contemporary realities in Ghana. Applying a case study approach is particularly useful in this respect, since this method is an approach for inductively exploring and identifying concepts, noticeable similarities, trends and patterns of socio-economic phenomena (Yin, 2003).

The case study research involves a series of 17 interviews with managers and/or owners of manufacturing SMEs. This may seem a limited number to justify research validity. However, the approach usually involves in-depth rich and detailed descriptions and a multidimensional analysis of the complexities and linkages of a few cases to gain an understanding of the (socio-economic) mechanisms and processes of the case subject. In the case descriptions, innovation as an economic phenomenon is the case 'subject', whereas the unit of analysis is a manufacturing SME. The case description holistically explores the type and basic features of innovation within the SME, and reviews the impact on productivity and competitiveness over the past 2 to 5 years.

The data for the case descriptions are obtained via 'semi-structured' interviews with SME owners and managers. 'Structured' refers to the systematic review and discussion of innovation(s) in the firms, the *innovation process*, *internal capabilities*, and innovation system actors around the firm, including *formal institutions*, the *business system* and *informal institutions* (attached as annex 1). These actors and institutions encompass formal and informal, private, public, and quasi-public institutions or organisations around the SME. 'Semi' refers to the interviewing approach of encouraging owners or managers to tell their story, and express their concerns and perceptions freely, without being confined to the 'questionnaire framing'. Of particular interest is what innovation means in the manufacturing SMEs in their context, and the less known favourable and unfavourable institutional conditions and barriers enabling or preventing it.

All interviews are recorded and transcribed. The data generated are entered and stored using qualitative data analysis software. The writing of the case is a step-by-step process of unravelling, ordering and organising the transcriptions into compact SME case descriptions of 2/3 pages following a similar format. The series of case descriptions are compared and analysed for patterns, differences and similarities in internal capabilities and socio-economic and institutional contexts. The findings are summarised as policy and research issues that could serve as input for the quantitative research of the 'Innovation Systems' and the 'Finance for Productivity Growth' themes under EIP-LIC.

1.3 Selection of SMEs and fieldwork

The selection criteria for the cases included:

- The company is a formally registered SME. In the DFID project context, an SME is understood as a company with 10-100 employees, whereas turnover, assets and capital formation are not considered. Access to financial information of SMEs is very limited in LICs.
- The company is involved in manufacturing.
- The company is a 100% Ghanaian owned/indigenous company. No foreign or joint ventures.
- The company introduced some form of innovation, preferably process or product, which resulted in increased productivity and competitiveness in terms of export promotion or import substitution. Other types of innovation may also be considered: management, business concept/practice, inputs, functional innovation.
- Value creation within the company, as a result of the innovation, is essential. This may concern a significant productivity increase by reduced costs (pushing the productivity frontier - saving on labour, capital, and input) or more sales and income due to the launch of premium products and competitiveness.
- Innovation process - idea, test, implementation and commercialisation - takes place in the firm and is initiated and owned by the entrepreneur. The SME owner appropriates the additional innovation value.

These selection criteria are defined in such a way that the selected cases represent the EIP-LIC target group: manufacturing SMEs. Moreover, the criteria assure a certain homogeneity within the selected cases, which will enable comparison of cases while supporting a certain validity of the identified trends or patterns. At the same time, allowing some heterogeneity, by including deviant cases, provides more contrast, and thus enables the research team to better construct and highlight divisions in the innovation process, linkages, system or mechanisms.

An essential element of the selection is the notion that types of SME innovation in LICs are not confined to technological (radical) inventions resulting from particular R&D investments and efforts. Innovation in manufacturing SMEs in LICs more often encompasses incremental adoption and adaptation or new combinations of existing technologies, products, marketing, management or business practices. Moreover, innovation often does not concern one type only. More often, an initial innovation enables and/or triggers other types of innovation within a firm; a new technology allows the introduction of new products, for instance.

1.4 Fieldwork

The qualitative data collection through interviews in Ghana took place in Accra and Tema from 20 – 30 September 2015. It was a challenge to organise interviews with SMEs. There are no accessible central registration systems of SMEs. Moreover, most SMEs are somewhat reluctant to publicise themselves: they do not advertise via websites, for instance. Identifying exporting SMEs was particularly hard in Accra and around. SMEs were identified by tapping into informal and personal networks, drawing information from the SME development projects from NGOs and donors. In total, 17 owners/managers were interviewed (see list attached as annex 2). No SME was earlier involved in the World Bank surveys or any other surveys. An average of 2-3 interviews per day were completed. The interviews typically took 1.5 hours.

The research team respected a set of ethical codes in conducting the fieldwork. This involved a transparent explanation of the project and the purpose of collecting the data. The research team provided assurance that the firms' data were kept confidential, with SMEs and interviewees anonymised in the descriptions. Before publication, a draft version of the report was first sent to the SME owner/manager to check whether there were any issues mentioned that he or she did not agree with, or felt uncomfortable with.

During the interviews, the SME owners and managers expressed interest in learning more about the project and about innovation in other SMEs. The team sent a copy of the final report to all interviewees, expressing their intention to maintain contact, and to 'give something back' in terms of participation in future policy debates, policy dissemination, contacts or networks. The final reports are to be accessible to the public and downloadable via the project website.

The original recording of the interviews and transcriptions are available for the project researchers - eventually open access - for further analysis and development of scientific papers and journal articles.

2. Introducing manufacturing SMEs in Ghana

2.1 The manufacturing sector and SMEs[1]

Ghana was once a growth model for Africa. An oil boom helped fuel the Gross Domestic Product (GDP) growth above 8 percent, making Ghana an emerging market star, a stable democracy whose population of 25 million was moving steadily into middle income status. However, Ghana's economy has lost its 'shine' recently. In fact, it is expected to slow to an estimated 3.9% growth rate in 2015, owing to a severe energy crisis, unsustainable domestic and external debt burdens, and deteriorated macroeconomic and financial imbalances. GDP growth was 4.2% in 2014, which was already less than the growth of 7.3% recorded in 2013. High growth rates over recent years have been accompanied by the build-up of macroeconomic imbalances. In 2014, current account and fiscal deficits widened to 9.2% and 10.4% of GDP respectively, and the rate of inflation averaged 17.0%. The continued growth in the budget deficit resulted in public debt increasing from 55.8% of GDP in 2013 to 67.1% of GDP in 2014. To address the increasingly unsustainable fiscal and current account imbalances, the Ghanaian authorities started negotiations for a stabilisation programme with the International Monetary Fund (IMF).

The service sector constitutes 50.2% of the economy's GDP, followed by industry (including manufacturing, mining and lumbering) and agriculture at 28.4% and 19.9% respectively. The manufacturing sector only plays a modest role in the economy, contributing about 9% to GDP. Ghana's most important manufacturing include light manufacturing, aluminium smelting, food processing, textiles, cement, pharmaceuticals, the processing of metals and wood products and small commercial ship building. A relatively small glass-making industry has also developed due to the high-quality sand available from the Tarkwa mining area. Most products are for local consumption and exportation.

The manufacturing sector provides employment for an estimated workforce of over 250,000 people. About 25,000 firms are registered. More than 80% of them are small size enterprises with less than 50 employees, while it is estimated that 55% of all enterprises are located within the Greater Accra/Tema Region.

The World Economic Forum's Global Competitiveness Report (2012-13) reflects the relatively unsophisticated production process in Ghana. The country was given an overall rating of 107 out of 144 countries, with a value of 3.2 out of 7.0 for product process sophistication, with 7.0 representing a country in which the world's best and most efficient process technology prevails. This score places Ghana below the world mean of 3.9 out of 7.0.

The full benefits of SMEs have not been realised in Ghana, largely due to the difficulty SMEs have experienced over the years in accessing capital, lack of entrepreneurial skills, lack of access to high quality and affordable business development services, erratic power supply, lack of adequate technical and management support services and limited access to information on market opportunities. The 'Business Barometer Report' of the Association of Ghana Industries (AGI) lists ten challenges faced by the manufacturing sector in Ghana, including competition from imported goods, low purchasing power, limited market size, depreciation of the cedi, increased taxes, poor power supply, high cost of raw materials, high utility prices, cost of credit and access to credit.

[1] http://www.reuters.com/article/us-ghana-economy-idUSKBN0EO0KD20140613
http://www.eservices.gov.gh/Pages/Empowering-SMEs-in-Ghana-for-Global-Competitiveness.aspx
http://www.commonwealthofnations.org/sectors-ghana/business/industry_and_manufacturing/
http://www.theodora.com/wfbcurrent/ghana/ghana_economy.html

2.2 Policy environment

The Ministry of Trade and Industry is the primary government agency with the overall mandate of formulating, developing, implementing, monitoring and evaluating trade and industry policies in Ghana. The ministry aims at developing a vibrant, technology-driven, liberalised and competitive trade and industrial sector that significantly contributes to economic growth and employment creation. The policies focus on facilitating enterprise development, including SMEs, development and enforcement of standards in trade and industry, promoting and facilitating Ghana's internal and export trade with emphasis on diversification and value-addition and promoting and facilitating Ghana's active participation in global trade through participation in multilateral institutions as well as championing Ghana's market expansion drive.

To meet the challenges posed by the changing domestic and international trade environment, the ministry is pursuing proactive top-down policies designed to create conditions for the renewal of Ghanaian industry and commerce. One major policy measure being employed for the achievement of accelerated and sustainable growth is the Ghana Trade and Investment Gateway Programme (GHATIG), which seeks to promote foreign direct investment and to establish Ghana as a major manufacturing, value added, financial and commercial centre in West Africa. Recognising that the revival of the industrial sector is key to Ghana's ability to develop a competitive manufacturing base, the ministry is currently developing a National Industrial Policy to complement the existing one.

- The Ministry implements its policies, programmes and special projects through agencies such as the Export Development and Investment Fund (EDIF), which provides loans and grants through 20 Designated Financial Institutions (DFIs) to producers and marketers of export goods and services. The fund also provides grants to associations, institutions and groups to boost the production and management capacity of such groups operating in the non-traditional export sector.
- The Ghana Export Promotion Council (GEPC) has as its mandate the development of Ghana's export trade and the promotion of Ghana's exports abroad. It acts as a coordinating institution for the various public sector and other organisations involved in trade facilitation, carries out advocacy services for organisations and individuals involved in the export trade and organises workshops, forums, conferences and seminars for such organisations and individuals. The GEPC also organises market and trade missions, trade fairs and exhibitions, and buyer-seller meetings, with a view to helping Ghanaian enterprises to do business in the competitive international export market. GEPC also has a trade information centre, which offers information and referral services to the business community
- The Ghana Free Zones Board has, as of 31 December 2015, 205 approved Free Zone Companies and five designated export processing zone areas.
- The Ghana Standards Board (GSB) is responsible for the nation's quality infrastructure and conducts its activities on the four pillars of metrology, standards, testing and quality assurance.
- The National Board for Small Scale Industries (NBSSI) is the government organisation responsible for the promotion and development of micro and small enterprises in Ghana.
- The Ghanaian government's GRATIS Foundation, with support from the European Union and the Canadian International Development Agency, aims to promote small-scale industrialisation in Ghana. It seeks to develop, promote and disseminate marketable technologies and skills for the growth of industry, particularly, micro, small and medium scale enterprises in Ghana and the West African sub-region.

There are several other institutions rendering support services to the manufacturing sector. These include: the Association of Ghana Industries (AGI), the Ghana National Chamber of Commerce and Industry (GNCCI), the Private Enterprise Foundation (PEF) and the Federation of Associations of Ghanaian Exporters (FAGE).

3. Empirical data: Cases of manufacturing SMEs

This chapter presents eight cases of SMEs whose owners were interviewed in Accra and Tema in the period 20 – 30 September 2015. The selection of eight out of the seventeen interviews conducted was carried out with a view to providing a concise, compact and homogeneous as well as a diverse bottom-up picture of the issues from the various SME owners' perspectives. The write-up format is similar for each case: a description of the innovation, the internal capability and external environment (formal institutions, business systems and informal institutions). Particular issues outside this framework, which were stressed by the owner and/or manager of the SMEs, are also included.

3.1 Garment - Uniform production (25 employees)

The company produces uniforms for private security agencies and schools. The owner had been in the garment industry for many years, producing mostly traditional African clothing, before starting uniform production. The company employs 25 people and is located on the northern side of Accra city centre.

The owner first came across the idea for producing uniforms during a trip in 2006 to Togo. He met with a Chinese textile manufacturer who was producing uniforms and working clothes for a Ghanaian firm. He learned that there were several Chinese companies based in Togo actively looking for business opportunities and contracts in Ghana. This prompted the owner to develop a plan for producing uniforms locally. He was confident that Chinese competition could be overcome by fast and flexible local delivery – "*my company would have an important advantage; I am here and the client can call me any time. I deliver small orders of 20 -30 uniforms. From China, the client would have to make a large order".*

Coincidently, the Regional Maritime University in Accra issued a tender at that time for producing 100 uniforms for their students. The owner submitted a bid, which he won despite fierce competition - "*The other competing companies went for higher profit. I closely reviewed the labour cost and input and other materials and added a small percentage and I ended up winning the bid".* After winning, he had to organise sufficient production capacity to meet both the quantity and quality requirements. He had to hire new skilled personnel because his company only had 6 employees. Finding skilled workers is not easy, but fortunately for him, an existing garment company closed down, so skilled and experienced tailors were looking for jobs.

In addition, the owner had to invest in more technologically advanced sewing machines. He went to a supplier for specialised Chinese machines and agreed on a price and terms of payment. In fact, the owner could not afford to pay for the machines upfront, but convinced the supplier to settle the account after the delivery of the order. The first uniform order was successfully delivered in 2007. After that, the owner managed to secure more orders and the company grew bigger. "*The business has been quite good since then, and there has been an increasing demand for uniforms from private security companies".* He is now a well-established name among the fast-growing number of security agencies in Ghana.

The owner sees good future opportunities in the Ghanaian clothing industry, which also includes uniforms for schools and hospitals. Many Western companies based in Ghana import their professional clothes for staff. The owner is convinced that he can produce these clothes locally with similar quality. He would like to expand into export in the future, but first, he plans to consolidate a strong client base in Ghana – "*There is a large market here. If I get to export, then fine, but I prefer to serve the local economy first".*

Innovation and internal capabilities

To research new types and designs for professional clothes, he browses the internet for ideas. His staff also provides occasional input and advice. When new designs are needed, they sit together in the workshop and

brainstorm and share suggestions, ideas and technical details. He usually does a small sample first to minimise the risk. At present, he is preparing a sample of a doctor's uniform for a presentation at a hospital in Accra.

The owner is actively exploring new technology and machines. Recently, he has purchased several other Chinese sewing machines. These new machines give him a competitive advantage locally – "*Other companies doing similar orders do not have such machines, and have much longer delivery times. The customers come back to me for that reason".*

His employees are not on a fixed salary; their contract is piece work and they are paid accordingly. The owner is satisfied with the quality of the workers – "*They do a perfect job in terms of quality and finishing: neat and produced on time".* His employees get a bonus if they produce more and faster. At the end of the year, the owner organises a get-together party and gives a little extra money to the employees. "*I am very free and relaxed with them, there is no strict boss-employee relationship; we talk and laugh and share jokes".* Regarding staff development, the owner trains new staff in operating the sewing machines. He prefers to employ skilled and experienced workers so that he does not have to spend a lot of time in training them.

The owner rents the company premises in the city centre of Accra, which is convenient for customers. Within Accra, he delivers the uniforms with a rented car. Most of the security agencies have their own vans, so they collect their uniforms. In the future, he plans to retain the office in Accra, but build a larger workshop outside the city, where land is available and is much cheaper.

External business and institutional environment

The owner is not aware of innovation promotion policies or government programmes. He knows that innovation is an important issue in Ghana, but he has never counted on any support for his business. Nor is there any interaction with technological institutes, universities or vocational training schools. Only on one occasion, a team of researchers from the government's Science and Technology Policy Research Institute (STEPRI) came to visit his company for an interview – "*Government departments often talk about big ideas and policies but never implement them".* There are employment rules and regulations, but application and enforcement of the laws is not strict, so he is relatively free to organise his workforce in a flexible way. He mentions that other owners of businesses may benefit from good personal connections from the government. Some people have support from the government due to political influence, but he himself has no political connections.

Getting formal credit from the bank for investing in machines has not been an option. According to the owner, the paperwork is too complicated and time consuming and the interest rate is too high (35% per year). In fact, there is little confidence and trust in small businesses. In the past, the owner tried to get a loan but stopped halfway through the process - "*My bank needed a house document as evidence of collateral and I had to go to the land commission and look for the papers at various offices and so on and so forth".* These days, he finishes an order and reinvests the profit into the business – "*The profit that I get is used to pay for the machines".*

One hindrance in the business environment is the regular electricity cuts, which cause considerable damage to the business. On one occasion, the lack of power meant the owner would not be able to deliver a job on time, and the client threatened to cancel a large and profitable contract. The owner had all the required staff and input material prepared to do the job. He needed a generator to solve the electricity problem, but once again he lacked sufficient funds. He agreed with the generator supplier to pay 50% upfront and the remainder after the delivery of his uniform order. He is proud to be able to survive in a difficult business environment – "*and I am on my own".*

The owner wishes that the government would work more closely with the textile industry. At the ministry level in particular, it should be easier to get access to information about the textile and garment sector and business opportunities. For instance, he came across some newspaper articles some time ago about trade opportunities with the US, and decided to go to the Ministry of Trade to seek information. However, after several hours of waiting, being sent from one desk to another, nobody could tell him anything – "*They even didn't know about the information they published themselves in the newspapers".*

He is a member of the Association of Ghanaian Industries (AGI), which provides advocacy and negotiates on behalf of its members in terms of government policies. He is also president of a garment association of small businesses for the domestic and export market. The association has about 40 members in Accra and is supported by UNESCO and the Ministry of Trade. The members share problems, ideas and advice during their monthly meetings. Sometimes they share contracts among association members. One member advised him, concerning his suppliers – "*If you pay the people in the market on time, then they will have trust in you".*

3.2 Food processing – Palm oil, mixes, and palm cream (110 employees)

The company started in 1994 with the production of various palm oils and related products. It is located on the northern side of Accra. The production processes, carried out in three large production halls, entail palm seed cleaning, cooking and milling, followed by extracting oils, drying the powders and cooking the creams as final products. A separate packaging and canning section is also a recent part of the company. To secure supply of the palm seeds used in production, the company has acquired 350 acres of land in different locations near Accra and in the Eastern Region. It cultivates oil palm, cassava, maize and other crops. The company has 110 employees.

Initially, the company focused on the domestic market. However, the owner soon realised the export potential of his products through his network of contacts. Moreover, distribution in the domestic market took a lot of effort – "*Maintaining contacts and managing the logistics in the three regions outside Accra were very time consuming compared to the returns*". The owner had previous overseas experience in food retail during a 5-year stay in the UK. This helped him a lot to use his network of good contacts among companies, importers and distributors, and to understand export requirements.

The company started exporting their products in the year 2000. Today the company only deals with 4 principal importers overseas: in Europe (Netherlands, Germany and Norway), the USA, Canada and Australia.

Innovation and internal capabilities

The owner sees a constant need to develop new palm oil and other related products. The demand is changing continuously and technological developments make new products possible. In recent years, many new products have been introduced as a result.

The current range includes banku mix, gari, cereal mix, kokonte and hausa koko powder, canned palm cream concentrate and canned eggplants. In the future, the owner foresees new products "*because day in day out our customers and importers ask if there is anything new".*

In this dynamic business context, the owner tries to keep well informed of trends, which *"helps me to be one step ahead of the competition".* Most of the competing companies are Ghanaian companies.

The owner has the advantage of exchanging new products within his international network of contacts and *"by so doing we are always ahead, and that has really worked for us".*

Product innovation goes hand in hand with new technologies in processing, labelling and packaging. The establishment of the canning section in 2003 was one key technological innovation. Considering whether or not to make this investment, the owner realised that there were only a few canning companies in Ghana, while the demand was high. The new machines enabled the company to launch new products with a longer shelf life. The owner believes that part of the success of the canned products was "*the existing and well-established reputation of the company brand in the market".*

The growth strategy of the company focuses on expanding the production volume and range of products. This involves innovation and technology enabling the firm to process raw materials into high quality food products.

The expansion of the range of products will create more employment in the near future – "*These innovations are not about saving on labour costs, but about the ability to produce new products that the customers want. Therefore we envisage growth in terms of both machines and personnel".*

The owner recognises the positive effect of employment creation, in particular for women – "*We have about 30 women employed directly, and the impact on their children is very positive. They are able to give good meals to the children and pay school fees, so the children get educated and learn about good hygiene: it is a multiple effect"*.

Internal capabilities

The owner considers himself a real entrepreneur. When he sees opportunities and other products overseas, he says, "*If others can do it, like producing some special type of product, I believe I can do it".* Once an opportunity arises, the owner reviews the financial implications and consequences. At the same time, he is

aware that one can never be certain about a business plan, financial calculations and forecasts – "*I am an entrepreneur, so I am able to smell an opportunity; that good feeling helps in taking some of these decisions".*

When a new product is first proposed, by a customer for instance, the owner and the principal product developer first brainstorm the overall idea and sort out the technical details of the process and the ingredients. Sometimes company staff from the factory come forward with additional ideas. There has been input from employees in one way or another in all the new products so far. The owner also travels 2 to 3 times a year abroad (The Netherlands, Germany and Belgium) and researches new products in the various shops. He often goes just *"to see products in the shops and to see how our products match with other products on the market in terms of presentation and pricing, and also to get customer feedback"*. If the owner sees an interesting product, he brings it back. He feels that every suggestion from a customer could be useful – "*We put it on the shelf since we cannot implement it immediately, even though it's a good idea"*.

The required minimum education level for staff is basic junior high school and the ability to read and write - "*We also have some university educated staff in product development and quality monitoring".* The company undertakes quarterly training for their employees within the framework of a UNDP and UNIDO programme 'Sustaining Competitive Enterprise'. Trainers from local institutions discuss production techniques and practices for the highest possible quality and current product trends in the industry. They show videos and give participating staff the opportunity to present their own innovation ideas.

Indeed, quality has been one of the important areas of attention to assure continued access to the export market. Internally, the company has an agreed practice and culture of everyone being responsible for quality assurance – "*You are on the machine working but you should open your eyes and observe".* Quality means, among other things, that the product looks traditional and natural. This is what the average consumer wants to see in the end product – "*The palm oil they remember from their grandmother's time".*

The company does not yet have any formalised bonus or reward system. However, some years back a staff member came up with the idea for a new and successful product and "*we gave him a bonus*".

External environment

Regarding the external business environment, the owner is facing several challenges. One major challenge perceived by many manufacturing companies in Ghana, according to the owner, is the unreliable electricity supply and frequent power cuts, which become more of a problem by the day. Without the generators purchased half a year ago, the company would not be able to survive. The generators can power the whole plant, but this brings with it a much higher cost "*which could have been invested into the product or raw materials. In a day, the generators use almost 1000 Ghana cedi (300USD) to keep the machines working and maintain production at the required level."*

The owner feels that the location of the company is not very good. Previously, the company was located in the outskirts of Accra, which is a more residential area. He tried to expand, but land acquisition was difficult and not well regulated – "*You acquire a plot of land and before you know it, someone else is claiming ownership".* The current location provides space, but it is some distance from the central district, and road conditions are poor. The owner is trying to lobby for investments in infrastructure by local government, "*but no matter how much you talk, you don't get anywhere"*.

In an effort to protect the brand name, the company has registered its name as a trademark, "*despite the fact that enforcement is weakly implemented by the government".* The owner feels that government officials and politicians are usually looking at short-term policies and programmes that will bring them power and benefits rather really helping the companies.

The owner is not very positive about the banking sector in Ghana. The interest rate for credit is about 35% per year, "*which is simply too high for any kind of business"*. The company has credit because otherwise it

was impossible to grow – "*Certainly for at least a number of years you cannot do without credit. You definitely need credit to be able to meet all the industry standards"*. The credit issue prevents the owner from doing things that he would like to do. Repayment is an ever-present challenge.

The company monitors the international firms in Ghana: their new and existing products, marketing, types of packaging, machines used etc. The company sees Nestlé and Unilever as its main role models. The company recently collaborated with the Food Research Institute in a yam preservation project. However, the cooperation was established through an informal contact, which ended when the person left the institute. The owner has just signed an MoU with the Food and Nutrition Department of a Polytechnic College. The students are working on developing food products and "*it's one of the things we are trying to do. They are studying food products and they have quite a number each year, so we can get many more ideas for product development".*

3.3 Engineering (metal) – Agro-processing machines (32 employees)

The owner started the company in 1971, designing and constructing agricultural processing machines such as corn, rice and cassava mills and palm oil pressing machines. The metal machines are modest in size and cost on average about GHC 50,000 (1,300 USD). Currently the company employs 32 workers, including technical staff, welders and constructors. For large orders, the owner recruits technicians from his large network of contacts for short work assignments. He leases the land where his company is located, which is a suitable location at a main road towards Accra city centre.

Innovation and internal capabilities

The owner gets most of his contracts from government institutions in Accra such as the Food Research Institute (FRI), the Council for Scientific and Industrial Research (CSIR) and the Ministry of Agriculture. He also services individual farmers in the domestic market in Ghana as well as in the wider region, including Guinea, Ivory Coast and other West African countries. He travels occasionally to these countries for installation and instruction. He also produces machines for international NGO development projects.

He usually first meets with the client, who comes with an initial design, ranging from very vague ideas to very specific designs. The owner starts to refine the design and further share ideas with the customers and his staff. Sometimes customers will come back, provide feedback or complain, but *"Whatever they say, I have to consider it. Sometimes it leads to new inventions and innovations*. Over the years, he has learned a lot by working this way.

For the Ministry of Agriculture, the company produces experimental machines for agro-processing of primary products. It is basic mechanical technology with occasional incremental improvements in terms of

shape, size, materials, rotation technique, screw conveyors and other mechanical aspects. He usually develops a few (proto)type machines and presents them to the ministry. If the machine meets the requirement and technical specifications, then the ministry normally places a larger order for wider dissemination. Not long ago, he built a special animal feeding machine. The contact person at the ministry showed him a video from a machine from Niger with the request to build a similar machine. It took quite some time, but after several failed attempts and further consultations – "*I got it right, just like the machine form Niger".*

The owner comes from a family of blacksmiths. His father, grandfather and great-grandfather were all blacksmiths, and he has continued in the family trade. He has no formal education in engineering or construction, but his practical experience helps him to design the machines. The owner completes most of the designs by himself. The creativity comes from within, he says – "*By the grace of God I will be able to do it. I don't sleep at all, I put it in my dream and before you know it, I have produced it".*

He sometimes ask for ideas and input from his employees. They sit together and deliberate on issues and solutions. The owner has a positive view of his workers' attitudes, and they respect him as the director. Sometimes when the owner trains an employee, they leave shortly thereafter to work for someone else, which makes him reluctant to invest a lot of effort in staff development.

His focus is on high quality products. There are many competitors but the "*beauty and quality"* of his products make the business successful, the owner believes. "*The products speak for themselves and word of mouth is the best advertisement".* He leaves the quality judgement in the hands of the customers. The company has a website, but there is no further active marketing effort or advertising. Word-of-mouth recommendation provides him with sufficient orders. The United Nations World Food Program put his company name and contact details on its website, after he produced some food machines for them in Liberia.

The owner sees that the technology is advancing, although it remains mechanical. The equipment for making the machines changes accordingly. The owner actively seeks information on better tools, equipment and machinery and advanced production technology. He envisages acquiring more of all of these, to be able to operate on a larger scale.

External environment

The owner is not aware of any promotion of innovation support programmes by the government – *"Policies promise to address all your needs but they do not pay attention to you afterwards".* He used to participate in trade fairs in Accra and other meetings organised by the government. The owner does not strongly state that the government is making the business environment complicated, because several ministries also place orders with him.

The owner does not have a trade mark or patents for his products. He did not do this because there are no strict rules or clear protection and enforcement on copying this kind of machinery in Ghana. There is a lot of copying of prototypes of machines and "*it is easy to add some modification so that nobody can prove that it is a copy"*. The owner is not so concerned about the competition of imported machines from China – "*Chinese equipment is mass-produced and made of cast iron or materials which are fragile and could easily break".* The owner uses steel, which is much more durable.

The provision of electricity is a serious problem, which has caused the closure of many Ghanaian businesses, in particular SMEs, as observed by owner. In order to overcome the unreliable supply of electricity, the owner had to purchase a domestic generator, but three weeks later it was damaged and now needs repairs.

Credit at the bank is a problematic issue. The interest rate is too high and prevents small businesses from taking out loans. This prevents the owner from expanding and modernising his business, since the machines, tools and equipment are very expensive.

The owners maintains regular contacts with technology development centres – *"They all come to my place and we do things together"*. CSIR involves companies in research projects with local technology development NGOs, in which the partners exchange ideas and bring their apprentices. The University of Science and Technology, the Maritime University and other polytechnics bring their students for assignments. However, the owner does not see positive outcomes from working with the universities, nor that these students and apprentices bring in new ideas. On the contrary, they "*came to tap our ideas. In one event, students from a university took my idea and design for a machine to process the oil. Afterwards, they acknowledged their professors and other members of the university but excluded my name from the project. They just came to take pictures of my machines and my idea and failed to even credit me for my effort".*

3.4 Wood processing – Functional design furniture (75 employees)

The company, established some 15 years ago, produces hand-crafted wooden functional design furniture, wooden accessories and handicrafts for the export market, mainly the US. The furniture includes traditional stools, tables, benches, side tables, consoles/wall tables and television stands. Another line of products is furniture accessories, such as vases, mirrors, bowls and wall hangings; and the handicrafts line includes traditional masks, dolls and figures. Their website indicates that *the products are handcrafted from eco-friendly wood and recycled local materials, reflecting nature's provisions and the spirit of the local artisan.* There are 75 people working in the company (5 office staff and 70 artisans) at present. The number of employees fluctuates over time, depending on the volume of orders.

The lady who started the business is not herself an artisan. She worked in the '90s as a secretary for a Ghanaian organisation 'Aid to Artisans Ghana' (ATAG) in Accra, an NGO which supported handicraft producers and promoted export. In 2000, she had to resign from her job and began processing and exporting wood products herself, taking advantage of her export experience, contacts and international network channels to the US. Initially, she started producing and exporting decorative traditional African art such as masks and figures. For the actual production, the owner engaged artisans nearby who did the carving in their homes. This way of outsourcing brought occasional coordination and supervision problems.

Shortly thereafter, the owner realised that functional design products was a promising opportunity. In 2003, she started converting some of the items into functional things and ascent furniture. Her husband joined the business at this time, because it had grown substantially and she could no longer handle it alone. They set up a workshop next to their house to provide working space for the local artisans. They brought in machines (a band saw, a mechanical planer and a wood turning machine) to do the work faster, although most of the work is done manually. Since then, the company has mainly produced functional design furniture for the US market, in particular for large American chain stores such as Marshall's and TJ Maxx. Sometimes the company exports small quantities to Europe.

The owners' daughter has also been involved in the business over the past year, with a view to taking over the business later on. The owners are happy "*because several companies in Ghana folded due to the problem of succession"*. Her daughter brought in some new ideas for advertising, such as the use of the Internet and social media as a marketing tool. As a result, new customers contact them after having seen the products

online and ask for the catalogue and price list. Social media is now also providing answers for technical questions – *"The company now has much greater exposure to a much wider potential customer base".*

They acquired another much more spacious plot of land nearby to establish a new workshop because the current premises are in a residential area and are becoming too small. The new premises will enable them to expand further and work with more artisans and expand production. However, there is a problem because they are waiting for the government to set up the electricity infrastructure, which is taking a very long time – *"If we want to fast-track to get the electricity connected, then we have to connect it ourselves. We applied and received a quotation of about sixteen thousand USD. We cannot afford that".* Due to the lack of electricity, they prefer to keep the workshop at their house for the time being.

The owners are happy with the business and they see that they have a social role to play in terms of creating employment. In Ghana, many entrepreneurs feel a kind of a social responsibility, as they say, *"not everything in the business is about profit-making, but also about playing a role in community"*. They take people off the street and give them skills training and employment and the means to earn a living.

Internal capabilities

The company has 3 'master craftsmen' and 2 'master craftswomen' who coordinate and monitor the work of the artisans in the workshop in the carving, carpentering, lathe operating, sanding, painting and polishing sections (the master craftsman and craftswoman are titles that the company came up with; an official skill grading system does not exist in the industry). The master craftsmen and -women are also responsible for training the new junior artisans, also called apprentices. The training takes place on-the-job during the production process of a received order. By the time an order is completed, the junior/apprentice has learned enough of the steps and knows how to work on his or her own. The company pays the apprentices during the training period. The presence of the apprentices helps to increase the production managed by the master craftsmen and -women, which increases their earnings. This system is thus beneficial for the master craftsmen and -women, the apprentices and the company.

The company is always in need of skilled craftsmen and artisans to meet large orders. Most of the junior artisans have little experience. They know several skilled artisans, for instance at the Madina market, the Arts centre (a craft trading center in Accra) and in Kumasi, whom they hire from time to time. In addition, employees recommend other workers. The owners also have a notice board at the gate to recruit new artisans.

Regarding input for their products and the supply of raw material, they use off-cuts and dead-wood of a specie called Cedrela: waste from the forest plantations outside Accra. The plantation farmers cut down their trees to create space to plant their crops alongside the plantation seedlings. The company obtained a permit to go into the forest and select the off-cuts and dead wood of the felled timber. The company's representative then picks these off-cuts and dead wood and cuts it into pieces of about 61 and 76 cm long. The women in the community are paid to carry these pieces from the forest to the road side. From there, it is transported to the workshop in Accra, which is a 4 hours' drive.

With regard to the development of their internal capabilities, the strategy and vision of the owners is to beat their competitors on quality and the uniqueness of their products. There are quite a number of furniture businesses in Ghana. They observe that the quality of their products is better because of their superior skills, internal organisation and technical equipment – *"Our pieces are well-dried and we use gas ovens for the drying. Our designs are also unique. That makes our quality and design quite different from what is available in town".* Several other companies in Ghana also export, but the owners set their own standards. They select good quality wood and pay accordingly. They pay the artisans properly so that they can ask them to deliver a good job in return.

The artisans are not on a fixed salary contract, they get paid piecework. There is an extra reward system for artisans who work well. The owners take care of their workers – "*When anyone gets sick, we take care of their medical bills".* They also registered the artisans on their initial National Health Insurance scheme. During holidays and at the end of the year, the owners give presents to the artisans. The women get cloth and the men get shirts, in addition to the rice and chicken to take home for celebration.

Over the years, there have been gradual changes in the functional designs. The owners get most of the ideas from their customers – "*The introduction of the functional designs in the first place was prompted by a request from a buyer for newer things".* The artisans provide some help and the company also collaborates with some external designers. The artisan, usually the master craftsman, comes up with the product. If the buyer selects it, then he gets a bonus on top of the income he earns. The owners also do sketches for the artisans to develop into samples.

External business and institutional environment

The owners describe the business environment as "*very difficult"* in Ghana. Their commercial outlets for sales, for instance, are not very stable. They suffer from the fact that customers come and go, on an irregular basis. Some buyers only place large orders once yearly, like the US buyers. This does not provide sales continuity over the year. The owners have worked with various trade facilitators for exports. The West Africa Trade Hub (WATH), set up by USAID, was one important institution, but has stopped dealing in handicrafts. The owners maintain contact with Aid to Artisans (ATA) Ghana, which informs them about potential buyers. They then meet and show their products to these buyers. The couple also frequently travel to trade fairs in the US and the Ambiente in Frankfurt, Germany. At these fairs, they try to get contracts for orders, but more importantly, they interact with the end users, which help them to get a feel of market trends and develop ideas for new products.

Apart from the export market, the owners are becoming aware that the local market provides an opportunity not to be missed. A growing middle class, with increasing purchasing power, is looking at more luxurious furniture for their homes. These people are prepared to pay higher prices for high quality goods. Moreover, there are a lot of new hotels in Accra. The owners realised that *"our domestic market is huge"*. Their daughter is taking care of sales on the local market for the time being.

Regarding the external financial context, they base their long term investments on their own savings and profits.

Sometimes they need short-term credit to complete export orders. In these cases the owners go to the bank, although it is very expensive. The credit rate is now 32% per year, but adding stamp duties and other charges, it amounts to about 40% per year. The paperwork is also a significant hurdle. Three years ago, they had a problem with export financing, and it took about three months to get a short-term loan – "*We are constantly challenged to stay in business in the midst of these problems".* Recently, they joined a revolving fund system, which helped them to complete an export order – saving 2 to 3 months of application time.

There is no clear support from the government or clear government policy or programmes in their line of business. *"It is as though the industry is just a sub-sector in the economy"*. They suppose that they are under the Ministry of Trade, but there is no well-defined policy to attract buyers of handicrafts - *"it appears that the potentials of the industry have not been recognised to attract the investment it requires".* Moreover, taxes are heavy in Ghana – "*If the government wants to tax us, that is fine, but not to the extent that we end up collapsing".* The owners feel that the government could help starting and growing businesses by providing them with some tax exemptions and other incentives as done for foreign investors and free zone companies – "*In this prevailing environment, lots of domestic companies are not exporting much, not earning enough foreign exchange and thus not making money. That is why the industry in Ghana is not stable and a lot of start-up exporters have gone out of business*". The one organisation that could support them is the government's Ghana Export Promotion Authority (GEPA), which is supposed to facilitate export activities. However, their programmes do not match the expectations of the handicraft exporters. *"Once a while they invite us for events and we participate to keep the relationship going, but it is not something we depend on. If there is a new problem regarding export regulations, we do not know whom to talk to"*. Regarding infrastructure, the situation is not good enough, especially in the hinterland. The roads are in a bad condition and the company suffers a lot from electricity cuts. They have a stand-by generator, "*but using it all the time is not a viable option – this is too expensive"*. Regarding the electricity connection for the new premises, they feel that the process is too slow.

The owners have a good network among the various institutions in Ghana. They have established a relationship with the Forestry Research Institute of Ghana (FORIG) of Council of Scientific and Industrial Research (CSIR). They are currently concluding a MoU to establish a working relationship for mutual benefit. This will enable the company's facilities to be used for research purposes while the company is also accorded some access to such research findings, especially in identifying appropriate new species and processing techniques. The company can make use of the research findings and also gain access to other research plantations. The owners are interested in new species of wood because some other species they use get depleted – "*So it is a win-win situation; the Forestry Research Institution can do research and we gain knowledge".*

They also participate in the Danish cultural programme coordinated from South Africa. Through this support, the company became a member of Design Network Africa (DNA). This is a network of about 20 African designers. In this programme, DNA invites designers who come in occasionally to work with the company on new designs and technical and design solutions – "*The main essence is networking to see what each of us is doing and what we can share, and because of that we have a good relationship with designers in Mali, Burkina Faso and South Africa".*

They have a relationship with the Kwame Nkrumah University of Science and Technology (KNUST) - Department of Rural Arts, which places final year students for assignments and internships. The next step is to expand relationships with other training and research institutions. They plan to partner with the national vocational training organisation – *"We want to make use of the young people, those who are into carpentering and wood turning so that we can work with them".* One of the activities is participation in the youth employment programme with the district assemblies. Under this programme, the company recruits young people (for a modest wage) and trains them at the same time. The owners consider this as part of their social responsibility.

3.5 Food processing – Yam chips manufacturing and selling (12 employees)

This catering services and food processing company was founded by a young couple 5 years ago. Its main activity involved the production of the typical Ghanaian *shito* (black pepper sauce). Three years ago, the husband and wife were brainstorming possibilities for food processing using local Ghanaian raw materials as inputs. The husband, educated in food and nutrition, scanned various possibilities. They came up with the idea to produce chips from Ghanaian-produced yam – instead of potatoes – "*Why can't we localise chip manufacturing using our yams? The yam is abundant over here"*. It is an original idea for Ghana and they are the only firm producing it, as far as they know.

Two years ago, the couple started to experiment with yam chip production. They produced small samples and evaluated the responses from neighbours and friends as testers. They found that the taste of the 'Puna' yam variety is closest to potato chips. The owners now use this yam, which comes from a supplier from the north of Ghana. Over the years, they have further refined the production process and "*it's getting better every day"*.

A second idea concerned the marketing: instead of using retail distribution channels, company staff sell take-away yam chips and chicken from mobile (pop-up) stands at strategic points in Accra. Their target group is middle-class commuters. The owner and staff install the stands in the morning, then fold them up in the evening and take them home. In teams of 2, the staff work at a selling point frying the yam chips and chicken to order on the spot. They use paper bags, in which they put yam chips, a piece of chicken, pepper sauce and a tissue. An essential point is *"good presentation of the stand in recognisable colours and attractive packaging"*.

The couple has five stands and employs 12 staff at present. Apart from selling at mobile pop-up stands, they also deliver door-to-door. Distribution to supermarkets is not possible because of the short shelf life of fresh yam chips. Sales so far have given them a lot of confidence in the market, *"and prove a promising Ghanaian market and export opportunities".* They have much bigger plans for the future. The grand plan is to produce frozen yam chips with a longer shelf life and move into the export market. They envisage setting up a separate workshop nearby with modern production facilities and equipment. This would involve a chip cutting machine, a blast freezer (an imported one costs 13,000 USD) and a sealer (one from Ghana is around 500 USD). This would enable them to do a "*really professional job"* and meet international market standards. Further ahead, they are considering franchising the yam chip mobile sales business concept – *"We would sell the idea of yam chips instead of setting up the stands and worrying about the frying".*

Internal capabilities

The yam production workshop itself is located in an annex to their home in the eastern part of town. They have simple equipment and cut the chips manually. Due to the lack of capital, the owners started small. They still lack funds for the machines they have in mind for producing frozen yam chips. With small profit margins, they have bought more input materials, and slowly but surely the business is expanding.

Despite their optimistic mood and promising sales, the couple occasionally struggle with the challenges of keeping the business going – *"There are times we have felt like giving up. Everything is so difficult and complicated".* One example is the production of the paper bags for mobile vending. They ordered a printing shop to produce nicely coloured bags in the company colours. However, the bags were not printed due to electricity cuts. They came up with an instant but unsatisfactory solution – "*We photocopied paper black-and-white printed bags ourselves"*.

In their efforts to develop the business, the owners involve their employees as much as possible. They have monthly meetings and review performance. They provide an honest and clear picture to the employees of how the business is going. The owners are very hands-on: they themselves do the frying and selling at the stands, if the situation requires it. The employees occasionally provide the owners with good suggestions. The owners ask them to air their views and present ideas and "*then we find the best way forward*". On the consumer side, the consumers help the couple to improve the product and operations. As the contact details of the company are on the paper package, several clients have called to give feedback on the yam and chicken purchased at the stand.

The couple set up a reward system for workers who perform well, but they did not really implement it. Since the owners are thinking of growing their business, they do not want to spend too much on bonuses and rewards – *"When our employees do well and meet their targets by the end of the week, we give a little something to reward their effort".* The owners have a broader notion of the impact of their company. They see that the manufacturing sector in Ghana employs many people – "*Our company could be able to help and provide employment to many young people".*

External business, support/services and institutional environment

The challenges of the business environment have been similar to those faced by all normal businesses. The business context is tough, and "*we've had a fair share. When you talk to other people who are also doing manufacturing, they will tell you about similar problems to those we are facing".* These included getting clarity on and consistency of rules and regulations, complications with taxes and location of the mobile stands, which involves an on-going "*battle*" with the Accra Metropolitan Assembly.

The couple recognise that there are many young innovators in Accra working in a harsh business environment. They regret that many of these efforts remain largely unnoticed. The owners consider themselves lucky, because they were noticed by a journalist, who saw the yam chip production and sales and wrote about it in a newspaper. The journalist specifically recommended the couple for government support within the framework of the Youth Enterprise Programme. Shortly after, a government representative contacted the couple and asked them to submit a proposal for support. The couple was quite excited because with this support and funding *"we will be able to go the next level".*

The couple received an award from the government as 'Youth Pioneer Entrepreneurs'. As a result, they were invited to attend a training course at the Council of Scientific and Industrial Research (CSIR) on nutritional issues. At this course, among other points, they learned that "*the nutritional value of yam exceeds that of potatoes"*. The course also provided very useful and practical background for the processing of yam into

chips. Another part of the award was a sum of money to invest in their business *"but exactly how much they are giving us we don't know yet, we are still waiting".* Apart from the training at CSIR, the couple has no other links with research or scientific institutions of NGOs. The owners did contact one local technology transfer and development NGO to find out if they could help to design a yam chip cutter. The cost quoted by the NGO was much higher than importing a new machine. Other than the CSIR and the youth enterprise support, they feel they are on their own. They are not aware of innovation promotion policies by the Ghanaian government.

Regarding further formal regulation issues, they have started a licence application procedure for proper quality control with the Food and Drugs Authority (FDA). The FDA has visited and inspected their workshop and the couple is expecting to receive the licence soon. In the future, the FDA will pay unannounced visits to inspect the products. The couple mentioned that their participation in the Youth Enterprise Support Programme facilitated several bureaucratic processes of the FDA.

The supply side of the economic environment is changing fast in Ghana, not always for the better. This complicates the business. As an example, the couple explains that the price of chicken increased dramatically in the past year as a result of the depreciating local currency – *"When we started, the price of a box of chicken was 45 cedis, but now it is twice that".* Because it is a new concept, the owners feel they cannot immediately increase the selling price, because the clients are not yet sufficiently used to the product, and *"they will walk away".* The supply of yam is less of a problem. The supplier of the yam is a farmer who also participated in the Youth Enterprise Programme.

Another major difficulty is getting credit in Ghana. The couple feels that the banks are not supportive of start-ups and SMEs – *"Banks do not want to take the risk until a business has established and positioned itself firmly in the market".* They see the reality of banks only doing business with larger established businesses, asking for collateral in buildings, and requiring the business to have been operating for a minimum of six months.

The company is a registered business, but has no trade mark or patent. Currently they are the only people producing yam chips in Ghana. The trade mark or patent application is complicated and takes a lot of time – *"we take it one step at a time"*. They are too much involved and concerned with the business operations and development. Sometimes people come in and ask how they do it, but *"we do not tell, it is our trade secret".*

3.6 Creative industry – Game technology applications (6 employees)

This technology company started in 2009 with the development of game apps for mobile phones and computer software. The company was founded by a Ghanaian and a Kenyan, two young men who met each other online in 2006 after a debate as to who was the first to develop video games in Africa. The company received initial funding from a business incubator programme in Accra - Meltwater Entrepreneurial School of Technology (MEST), involving seed funding of 100,000 US$, office space and hands-on management support. MEST further engaged experienced entrepreneurs to provide mentorship for software start-ups – *"The great advantage is the immediate network around. You can walk across the hallway and talk to another company and they can introduce you to an advisor somewhere"*.

At present, the Kenyan partner runs the technical team in Nairobi, whereas in Ghana the team is involved in product development and creative design. Consequently, ideas and technical implementation go back and forth. There are 6 full-time employees and now and then a few university interns. Often the company employs more temporary staff, up to 15 people, to complete complex or challenging orders.

Innovation and internal capabilities

The company has two lines of activities. The first concerns the development of 'traditional' game software and apps for corporate clients and NGOs. This commercial activity has been essential for the company's survival since 2009. Among others, the company developed a maternal health education game for nursing education for the Oxford University and the Kemri Trust Foundation in Kenya. Another game was developed for a Kenyan NGO with the aim of enabling voters to assess candidates in an election. Their client list includes Microsoft, Intel and Vodafone. They also developed internal games for companies to train their employees.

The company sees a strong future in developing games for education and training purposes. One idea is to develop a product which integrates teaching in mathematics, science, arts and engineering because *"in game software development, the creative aspect is very necessary, so we preach creativeness in computing and mathematics education".* The owner is also considering educational software for government institutions to help reading in schools. He is trying to get banks as clients for staff training games, and has already developed some financial games to train people how to save and invest.

The second line of activities is under development, but should eventually become the company's core business. This concerns the creation of a series of products, including game apps, software and comics within a conceptual story framework called 'Africa's Legends'. The framework involves a group of super heroes, historical figures from different African regions. For example Ananse (Ghana), Shaka Zulu (South Africa), Pharaoh (Egypt) and Masaai (Kenya/Tanzania). The underlying idea is to use African identity as the basic characters with strong storytelling in the games and comics. These *"super heroes"* fight the contemporary problems in Africa, such as hunger, political instability, terrorism and Somalian pirates. The underlying idea of the owners is to tell African history in a 21st century format, through their products – *"Our specific strength is building games with African characters and telling African stories better. That is our unique strength in game development".* They realised that Africa has "*too many cool stories that are told in very boring forms".* The felt that Africans have not been able to communicate their history in modern forms – "*In the creative industry, fantasy is what creates hope".* The owners envisage that Africa's Legends will create that – *"This sparks children's imagination and it will encourage them to read history".*

The owners found that, in the Western world, the games industry is bigger than the movie and the music industry put together, and *"Africa is not contributing anything to that"*. The owners believe that Africa has a major opportunity in developing localised versions of games and software programmes. The owners are ambitious – *"We are not only creating a company but creating a whole new industry in Africa"*.

The company launched its first products within the Africa's Legends framework last year. They encountered the problem that there are already many good games and products on the market, usually developed in Western countries. To position themselves, the company launched free products such as digital comics, games, wallpapers and videos for Android, Windows Phone and Java. The free products serve as a test of people's reactions. Once people to get used to the story, the company will start to charge money for new Africa's Legends products. In fact, the owners plan to develop a large Africa's Legends flagship game to play on Xbox or on a PC with the idea to compete in the global market. This plan involves a serious investment of around 1 million US$.

Investment money is not the only challenge; attracting knowledgeable and skilled staff is also a difficulty. The development of games is complex and expensive – "*Without the right technical and creative skills in the team, it is very difficult to make a game that can compete internationally".* It is key to recruit, organise and manage a multidisciplinary team with the required skills and one that collaborates intensively. This is a real challenge; forming a team with a story writer with English language knowledge, an artist with creative skills, a programmer with a good understanding of computer science. To develop the flagship Africa's Legends game, the owners envisage involving story writers from the different African regions, because they know their characters better.

However, it is difficult to recruit staff with the right skills in Ghana. Game development is not taught in the universities; it is a new avenue – "*Everything that we know and do is self-taught"*. The owner started programming in junior high school. By then, he says he was addicted to comics and computers - "*I was a very troublesome kid, always hacking"*. The staff recruitment approach involves bringing in interns, final year university students, who then develop into staff members.

External business and institutional environment

The company has few competitors, but is not the only game development company in Africa. In Nigeria, there are now quite a number of start-ups. The owner considers the business environment, in terms of market and opportunities, to be very promising. There is sufficient space for competitors in the African market and he welcomes competition. This will help him to validate the products on the market – *"An investor won't invest in us if we are the only one making games. So we encourage others to also develop games".*

With respect to launching the ambitious Africa's Legends game, the owner is looking for serious investors to secure the 1 million $. Credit from a bank is not an option. The interest rates are too high and application procedures are too rigid and complex. Currently, banks give very few loans out to software companies. This is one aspect that makes the business environment difficult. The Ghanaian owner has other funding options for example he was nominated for the Africa Entrepreneurship Awards 2015 sponsored by the BMCE Bank of Africa in Morocco and hopes to win – *"It's a million dollar award and I hope to win"*. If he wins this award, he will invest the money in the company.

The Ghanaian owner is bothered by the bureaucracy, rules and regulations, while there are no support policies or programmes. The government is not supportive, "*but that is okay - we just operate without the government"*. The owner regrets that there is nobody within the government who sees the potential of the initiative – "*They don't have any idea about the industry. Sometimes it hurts because there is no policy for supporting our industry" Probably research projects, like the DFID project, can help to raise our profile with the government".* The owner feels that government institutions and tax departments always take and never give. Government policies and regulations for product protection are not transparent.

It is difficult to arrange and safeguard intellectual property. The owner is in the process of registering and arranging the copyright of the Africa's Legends characters, but securing worldwide rights is an expensive process. Once you start a business, full taxes are immediately payable – "*At times we considered leaving and setting up our company in Mauritius".* However, the owner is patriotic and believes that his company will generate good revenue one day. This will contribute to the Ghanaian economy so "*we just try to stick to our passion".* Another original thought is that under Africa's Legends, the company could develop a satirical comic criticising incompetent policies, lack of enforcement and greedy presidents or politicians – "*That is the great thing about comics. Africa has too many problems and we can solve them by telling them in a fantasy world, which can then affect the reality".*

There is also a cultural issue with games in Ghana. The country is not games-oriented and the owner has to convince clients that games are *"good and useful",* for training for instance, before he can sell them –

"*Outside Ghana, they know what games can do and they just get the game they want. Here, you always have to fight two layers; first fight the culture and then sell the product. That was quite difficult in the beginning".*

External assistance was limited to the British Council in Accra. The company participated in the Young Creative Entrepreneurs' Award. The company also benefited from the support of the MEST incubator programme, outlined above. The company also attracted a lot of media interest because of their game development in Africa. For instance, in 2012 the company made a game for iPhone called i-Warrior. The BBC immediately covered the story "*because it was an innovative thing from the region".* The US embassy organises programmes and recommends the company to other people who are interested in the business.

3.7 Publishing and printing – Educational materials (40 employees)

The company publishes and prints a broad range of educational materials and textbooks for children from kindergarten to senior high school level. In 1994, the owner started as a book retail shop in Accra city centre. Shortly thereafter, he felt that he needed something more challenging than buying and selling books -*"At that time, I had enough courage and energy to tackle real difficulties".* Two years later, he started publishing and printing educational books. He took out a loan from the bank and purchased second hand printing machines from Germany. He installed a production line in a facility in the western part of Accra, still operational today. The company now has 7 vans that deliver the books in Accra and the surrounding area.

For sales deliveries further afield in Ghana, the owner recently opened distribution branches in two other cities. These depots/warehouses make deliveries much easier and faster. Today, the total workforce in Accra and the 2 branches is 45.

Innovation and internal capabilities

The company offers services in both publishing and printing. "*The publishing, as the first stage, deals with content development and design such as the format and layout of the textbooks"*. The company hires a group of high school teachers to write the texts for each subject, based on the background curriculum and syllabus provided by the Ministry of Education. The company provides the teachers with facilities and resources to develop the textbooks. The texts are subsequently edited, formatted and lay-out is designed for the actual textbooks. The printing process is the second stage, "*when it is camera ready"*.

The owner mentions that publishing is more important than printing in terms of adding value, in particular developing the content. Publishing serves as the core activity and "*we do not print materials from other publishers. The publishing is the main activity"*. The company is one of the few in Accra that combines publishing and printing. Many companies only do publishing and outsource their printing to another firm. "*In Ghana, there are about 90 registered publishers but only about 25 are active and about 5 of these do publishing and printing"*. According to the owner, the business model of combining the two under one roof is based on cheaper production.

Within the generic framework of the syllabi and curricula of the ministry, the content and layout of the educational textbooks is different and company-specific. Each publisher will produce different content, and this generates competition – *"It is the content where competition comes in and the area in which to stay ahead of the competitors".* The owner does not buy his competitors' books to compare with his own – "*It is unprofessional to buy your competitor's books. We have confidence in our work. Some other people do – we do not".* The company gains feedback from the market, schools and other institutions that use other publishers' books and uses this information to improve on their products.

The development of educational textbooks is a process that requires updates and modifications every year. The Ministry of Education provides yearly updated educational standards and guidelines for the textbooks. Consequently, the company revises the educational books and positions itself in the market so that the schools

and students buy the books. The owner also gets suggestions from the employees on how to improve the publishing and printing – "*When issues come up, we sit down and discuss them"*. The owner organises management meetings and consultation with other staff teams, such as the book development and design departments of the company.

The market for educational books is not big. The company sells some of its books to book shops and directly to schools. Another outlet is through tenders from the Ministry of Education. The government tenders are profitable because they are bulk orders. The ministry requests teaching materials for public schools for the whole country.

The company finds it a challenge to find skilled staff in Accra, for publishing in particular – *"It is very difficult to find the right person with the right attitude".* The owner advertises in a local newspaper for new staff. Usually around 100 people apply. There is a selection process through interview and short practical tests. If the person is accepted, then he or she gets a probation for six months – "*Once you put people on the job, then you see whether they are qualified".* On one occasion, the owner hired someone and found out later that they were unable to do the job – *"Firing is not an enjoyable part of the game but sometimes I have to do it"*. The owner finds new university graduates unsuitable, because they only have theoretical knowledge. He also finds the attitude of Ghanaian staff to be unsatisfactory – *"The staff are very difficult to handle and that comes from our culture".* The owner was in Japan for 5 years and saw a very different working mentality there.

The company trains new staff on-the-job during the probation period. For existing staff in the publishing department, the owners regularly send the designers, editors and illustrators to 1-3 day training workshops organised by the Ghana Book Publishers' Association – *"It is very important that staff attend, to sharpen their skills, despite the costs of the workshop".* One problem is that occasionally newly trained staff have moved to other competing firms. His company, in common with other small firms, is therefore very careful about training.

The owner would like to acquire better publishing computers and printing machines that can produce better quality books, but a lack of capital means he is unable to do so. For the first machine in 1994, he took out a loan from the bank. After this, he saved money from larger ministry contracts for new investments. He does not borrow from banks or friends to buy machines, "*because the interest rates are very high: around 35% and above".*

External business, support and institutional environment

In Ghana, the business environment is "*very rough"*. There is widespread corruption in government – "*You think you are going for a tender for a government contract and then you realise that it is not a fair game, as there is already an arrangement".* The bureaucracy and regulations within the government are not clear, and once they are clear, nobody follows them. "*We have to work in an environment where the institutions are not working. Everything is blocked"*. On paper, the policies and programmes look good, but the reality is very different. Even within the legal system, the judge will take money for the judiciary service, so "*where will you go for justice?"*.

There is active competition within the educational textbook market in Ghana. Notably, some educational textbooks are printed in India. Production costs in Ghana are very high, which makes it difficult to compete with the imported books from India. One key issue is the high cost of imported paper, the main raw material for the production of textbooks. The owner sees an incompatibility in the legislation because his company has to pay import duties for importing printing paper, whereas there is no duty for importing the printed finished textbooks from India.

In the future, the owner hopes to double his current turnover, and to see forward momentum – *"We do not think of negative scenarios, we have positive minds"*. As the turnover grows, the workforce will be expanded.

3.8 Food processing – Red pepper powder (16 employees)

The company, located in the industrial area of Tema, some 20 km east of Accra, produces powdered red chilli pepper. The owners, a Ghanaian logistics expert and an American management and finance specialist, who previously worked with an NGO in Ghana, were reflecting on business opportunities in agricultural primary products. Their initiative was triggered by the fact that the locally processed powdered red pepper available on the Ghanaian market was of poor quality – *"The farmers who are supplying and the firms processing the pepper are not really doing a good job"*. They saw a business opportunity in producing high quality powdered pepper, both for the local market and internationally – *"The great advantage is choosing to start our business in Ghana is that the climate enables chillies to grow year round".*

The key element of the business concept they came up with was the inclusion of several steps of the value chain under one roof. Critical to their plan was monitoring and controlling all these steps according to international quality standards. This integration comprises growing chillies (in partnership with smallholders), processing, packaging and marketing the end products. They work mostly with smallholders in the Volta regin and will eventually establish their first farm of 400 acres in 2017. A big advantage in growing the peppers themselves is control of the supply, which is essential for planning and meeting customer orders – *"Other supplying farmers can disappoint at any time when there is competition in the market"*. Indeed, the price for chilli pepper fluctuates considerably in Ghana.

The owners also have a broader societal agenda. They apply sustainability practices in growing red chillies at the farms by encouraging organic fertiliser use and keeping the use of pesticides to a minimum. They know that it is possible to do so within certain geographical locations in Ghana. The sustainability practices will also appeal to Ghanaian customers, who increasingly care about natural products – "*Ghanaian customers are becoming more aware of the harmful effects that chemical residues can have on the daily foods they consume. All things being equal, consumers here will go for the healthier choice".* The owners envisage using this argument in their marketing and advertisement strategy.

The owners started with the processing and marketing of powdered red pepper in 2014. Today, the company employs 16 people in total. They gained the Food and Drugs Administration (FDA) approval for their product and production facility in December 2014. The owners tolerated some losses in the beginning, "*but it's just for a short period… we expect to start making profit next year [2016]".* For the near future, the owners have ambitious plans – "*Our goal is to become the number one in quality and market share of processed red pepper in the region"*. They want to develop Ghanaian agriculture to an international level, starting with red pepper, a product that most households use in Ghana and that is produced all over the country.

Innovation and internal capabilities

The Ghanaian owner, who holds degrees in both Electrical Engineering and Information Technology, is responsible for the technical processes, while the American manager focuses on the financial and business management of the company. The company gets regular external advice on technical problems from hired experts. At the same time, their staff often come up with ideas and solutions for emerging challenges. The owners are open to all such suggestions from staff in the business – "*You might get somebody who is an HR person but happens to have a feel for the machine. In a start-up it's really a team effort where staff members from every department have opportunities to solve unique challenges"*.

At the pepper processing facility in Tema, the three stages include drying, milling and packaging the pepper. The drying happens at a temperature of 80 degrees and minimises the moisture content of the chillies. This prolongs their preservation, or shelf-life, kills bacteria and microorganisms and makes them crispy for milling. The company purchased a drying machine from Ghana. For the subsequent milling process, the company purchased two millers: one locally made and another imported from China. The owners consider the Chinese pepper miller a better machine. The company has two packaging machines imported from China. Although their experience with the machines is good, packaging machines in the future will come from Spain or other high technology western European nation. These cost a lot more, but the Spanish machines meet the highest international standards and are amazingly efficient compared to alternatives in Asia. This is critical to their export ambitions.

The owners have great confidence in both the Ghanaian and the export market, based on research they conducted. In the past two years of operation, they gained experience and sufficient confirmation of these market opportunities. Their main target is the export market, "*but we will not forget the local market, even if our product is an export success"*. They consider it a part of their corporate social responsibility to make sure that good quality products from Ghana at affordable prices are available on the local market. One challenge yet to be overcome is that Ghanaians do not have much confidence in what is locally produced – *"Ghanaians believe that what is imported is far better. Sometimes Ghanaian rice is put in bags with imported rice brand names"*. The owners hope to create awareness that Ghanaian powdered pepper products are not only good, on par with any other global brand.

In order to realise their ambitious plans in expanding the production process while applying sustainability principles, the owners need serious investment money. The financial manager is working with KPMG on an investment plan covering the costs of new land acquisition for farms, irrigation equipment, new machines for drying, milling and packaging – "*So the business we have been doing for the past two years is kind of like a pilot".* The target is to get between 4.5 and 5 million dollars. Soon they will present the plan to the investment community. They envisage employing 45 staff in the processing plant and an additional 54 at the farm. They will also engage about 400 part-time seasonal workers at harvest time, and enter contract-farming partnerships with thousands of smallholders over the next five years.

External business and institutional environment

Regarding the business climate and particularly with regard to competing with imports, the owners feel that the Ghanaian government makes it very hard for local manufacturing companies. A problem is that the government "*hits"* them with the high value added tax and National Insurance Levy (VAT/NIL) of 17.5%. This rate reduces profit margins and discourages local manufacturers, as they say, even jeopardising local food security. The owners cite the example of the amount of rice that the government imports, in a country with a lot of unused farmland and ineffective support (tractors) provided to farmers. In fact, Ghana is increasingly importing foods – "*A lot of things are imported: that doesn't make sense".* The high VAT makes Ghana a very uncompetitive place compared to China or the America and many others. The owners wish to see Ghana export processed agricultural products and foods. Another issue is the lack of prioritisation and coordination of industrial policies – "*If the government takes a firm decision on future directions with regard to agricultural production, local manufacturing and import, that would provide the stability and clarity we need".*

They have a trademark to prevent other companies from copying what they do. The idea of manufacturing and exporting high quality powdered red pepper is unique in Ghana, as far as the owners know. The owners in their search efforts did not come across a single licensed exporter in Ghana nor in the whole West African region. "*For people already in the business it might be easy to copy; for newcomers it will be difficult with regard to investment".* The owners are not worried – "*The potential West African market is about 360 million*

customers and most of them eat chilli pepper every single day. We just should focus on quality and meeting international standards and we will be okay".

The owners regret that support and information from the government is not available. One of the owners went for information to a government ministry to find out what forms of capital would be available. However, the government agency in question was reluctant to give information to him, but did so later to another person. It is this favouritism that concerns the owners. Indeed, things can be very different, as experienced by the Ghanaian owner, who is doing an MBA in entrepreneurship at a business school in Accra. He was surprised by the approach of his business coach, who was very open and active in establishing all kinds of contacts for him – "*If everybody in Ghana who is trying to develop a business got such assistance, it would makes life easy for us".*

Their collaboration with universities in Ghana is limited to students who come for an internship. To complement their theoretical background, the students get some practical skills, such as food processing. The owners regret that there is not more cooperation, in particular in doing joint research – "*We have not gone into the university to explain what we do, and ask if there is any assistance they can give to us".* The owners have some research ideas with regard to red pepper varieties and practices for developing high quality seeds, *"and we would welcome students from the universities to do their research in these fields".*

The owners note that the universities and government institutions in Ghana are not able to analyse nutrients and vitamins, whereas they need quick quality and nutrient analysis of their pepper products. The owners know that in New Mexico and elsewhere in the US, universities do a lot of research into pepper processing and conservation, in collaboration with industry. The owners found many reports and other information sources that helped them a lot in starting the business. The research reports addressed similar challenges – "*So when universities do studies and publish it for free, it benefits everybody".*

4. Analysis and conclusions

This qualitative study aims to support the quantitative research part of EIP-LIC, as well as other related research projects, by enabling the researchers to validate, compare and complement existing theory and research design and hypotheses development with contemporary realities on the ground in Ghana as perceived by manufacturing SME owners and managers. These insights comprise how innovation processes and mechanisms are manifested within manufacturing SMEs, the internal capabilities and external environment, including formal institutions, the business system and the informal institutional context as reflected in the list of semi-structured interviews (see Annex 1). In addition, the owners and managers shared their stories outside this framework and advanced issues that may be overlooked in current theory, which they perceived as relevant and critical to innovation and productivity in SMEs.

In the paragraphs below, several key trends and notable patterns across the cases are analysed and reviewed against related theoretical insights. It is important to note that this concerns a first analysis of the qualitative empirical material within the DFID project context, which is to be followed up in more depth with a view to developing academic papers (all original transcriptions and recordings are systematically stored). Some initial policy ideas and implications are suggested. The chapter concludes with several observations with regard to the set of research questions within the research themes 'Innovation Systems' and 'Finance for Productivity Growth' of EIP-LIC.

It is important to note that the validity of this qualitative research report should not be considered in terms of representativeness of the cases for the total manufacturing SME sector in Ghana. Qualitative research does not claim to collect and analyse data from a representative sample. Instead, on a case basis, qualitative analysis provides insight into issues, processes and systems in a bottom-up way that helps to clarify theoretical concepts for the local context, and suggests original or overlooked and policy-relevant factors (variables) and conditions to follow up in the quantitative analysis. Against that background, the selection of cases involved 'information-oriented' sampling aiming at developing a diverse yet comparable dataset with regard to subsector, enterprise size and innovative activities.

4.1 Trends and patterns in the cases

General observations

A first overall observation from the preparation and implementation of the fieldwork was the difficulty in identifying formally registered SMEs (10 - 100 employees) in manufacturing in Accra and Tema. SME owners and managers were reluctant to receive the interview team at their premises. At the same time, the qualitative research team came across many micro, household-based and informal businesses with fewer than 10 employees; their identification was much less of a challenge. From the interviews with several of these smaller firms, not included in the case descriptions in the previous chapter, it appeared that some of them had plans to expand and grow, but the harsh realities in Ghana prevented them from doing so. The owners reported that they did not dare to take the risk because of the challenging business environment, preferring instead to stay 'below the radar'. They particularly mentioned the difficulty of getting credit and the unpredictable government regulations with regard to market access.

Although direct evidence is not available, the upgrading and formalising of informal micro-enterprises in Ghana seems to be a problem. This refers to the 'missing middle' issue; a phrase that has been used relatively loosely in economic development discussions, meaning a lack of SMEs in the developing world[2]. Africa's

[2] http://www.africa.com/blog/investing_in_africa_defining_themissing_middle_/

private sector consists of mostly informal microenterprises, operating alongside large firms. Most companies are micro and small because the private sector is new and because of legal and financial obstacles to capital accumulation. Between these large and micro/small firms, SMEs are very scarce.

Innovation definition

The owners and managers in all interviewed companies in the 8 cases in the preceding chapter, in different ways, introduced new products, processes and technology in order to improve and expand their business operations. In advanced economies' innovation terms, in which R&D expenditures and number of patents are typically measured (OECD, 2005), these cases probably would not be assessed as innovation. Such an assessment would in any case have been impossible because the owners do not systematically record R&D expenditures and have not registered patents.

Taking a broader perspective on innovation, viewing it in terms of incremental adoption and adaptation or of new combinations of existing technologies (Szirmai et al., 2011), it is evident that the new elements introduced in the interviewed companies resulted in better and more business operations, creating value. As described in emerging innovation theories on LICs, much innovation depends *on an aggregation of small insights and advances through 'learning by doing' rather than on major technological inventions* (Carayannis et al., 2003).

Despite increasing interest in the literature, the exact definition of innovation in LICs remains a problem (Çapoğlu, 2009). How should researchers distinguish innovation in LICs from other activities? The broadest possible definition of innovation would be everything new that the company does to survive and stay ahead of its competitors. Innovation could be considered as a 'means' towards the ultimate objective of raising productivity and increasing competitiveness. A cross analysis of definitions in innovation theory from recent decades (Voeten et al., 2011) shows that innovation is repeatedly typified by three key elements: newness, process and value creation (see box 1)

Box 1: Innovation newness, process and value creation (Voeten et al., 2011).

Addressing the first element, Kotabe and Swan (1995) argue that innovation can be investigated in terms of both **newness** to the company and newness to the market or world.

Regarding the second element, the innovation **process,** all owners and managers themselves initiated, managed and owned the innovation process within the unit of analysis, their company. They developed the idea, sometimes inspired by others, started to run small experiments and trials and eventually implemented the new product or production technique on a commercial scale. As is often the case in incremental innovation in developing countries, this is not a planned and formalised process involving a pre-defined innovation strategy and an R&D department.

The third element, **value creation** of innovation, is evidenced either through lower input costs or higher sales revenues (Porter, 1985). Higher profit through new premium products of better quality, or appealing to a certain fashion increases competitiveness.

Kaplinsky and Morris (2001) identified five types of innovation: (i) process innovation aiming at improving the efficiency of transforming inputs into outputs; (ii) product innovation leading to better quality, lower price and/or more differentiated products; (iii) business practice innovation implying new ways to organise business and attract new clients; (iv) functional innovations – assuming responsibility for new activities in the value chain, such as design, marketing and logistics; and (v) inter-chain innovations moving to new and profitable chains. In many innovation definition and measurement documents, such as the OECD Oslo Manual (OECD, 2005), an explicit distinction between product, process and other forms of innovation is made. However, distinguishing the types of innovation in the Ghanaian cases was not such a clear and simple

process. It is more common to see a combination of several types of innovation, where one type triggers another, such as the introduction of a new process (technology) that enables the launch of new products. The Ghanaian cases show a combination of new technology, new processes, new products and new clients within the companies.

Next, the newness, process and value creation aspects and the type of each case are described:

- Case #1: The innovation of the garment case concerns the introduction of uniforms for security companies. Uniforms are not new to the world, but were new to the firm. Along with this product innovation, new technology was also acquired. The innovation process (idea, test, and commercialisation) was initiated and managed by the owner within the firm. The owner was able to yield the created value of the new product at new markets. This increased the competitiveness of the company.
- Case #2: The palm oil company initially produced for the local market, then accessed the export market (marketing innovation). This implied an increase in the quality of the products by new production processes and technology as well as the introduction of a range of new and diverse products. The new products and processes were new to the firm, and the process was initiated and managed by the owners. The company gained a competitive position and the new products generated value in terms of turnover and profits.
- Case 3#: The engineering company is developing machines to order for processing agricultural raw materials. The machines are constructed with small improvements and adaptation in the mechanics. The question arises as to whether this could be labelled as innovation, or would it just be a product 'improvement'. The ownership of the improvement was not entirely with the entrepreneur, because the clients also brought their ideas and design. There were no new technologies acquired or new processes introduced in the production process.
- Case #4: The product innovation concerned the shift from traditional masks and decoration into functional furniture design and production. In a way, their particular designs are new to the world. The new products required a reorganisation of the workshop and management. Some new machines were acquired. The new design and the advanced processing add more value to the wooden products.
- Case #5: The catering service introduced a new product: yam chips. Along with the product innovation, the owners introduced a new way of marketing the product (mobile fast food stands). The product and business practice are new for the company. The owners initiated and managed the innovation process.
- Case #6: The company launched the design and production of a new line of products. Apart from product innovation, this development could also be labelled as 'functional innovation' because the firm included the design step as well. Previously, the company only developed software to order, meeting required specifications.
- Case #7: Although the publishing and printing company is constantly updating their education materials, the ideas and requirements come from the Ministry of Education. The innovation process is not initiated and owned by the manager. There is no acquisition of new technology.
- Case #8: The chilli pepper company was newly set up to produce high quality pepper, a product new to the firm but not to the world. Apart from the new product, the company acquired some new machines, but more importantly, the company organised the growing of chilli, as the first step in the value chain, within its company, which could be labelled as 'functional innovation'.

Innovation

Although the new products and new processes in the interviewed Ghanaian companies were not radical and not 'new to the world', they were new for the companies, as units of analysis. Interestingly, most company owners and managers did not perceive their incremental adoption, adaptation and new combinations of existing technologies to be innovation. They associated innovation with a radical technological invention or breakthrough. All the entrepreneurs have great confidence in the market, which motivates them, even in the

harsh business and institutional environment in Ghana. Starting small, step-by-step they have been learning about the market potential of their product. In fact, all the innovations observed in the cases are the product of experiential learning and a process of doing, using and interacting (DUI), as earlier described by Lundvall et al. (2009).

Most of the innovations concern the introduction of new products processed from primary (agricultural) products - palm oil, wood, yam and chillies - available in Ghana. The workforce mostly comprises unskilled labourers. The production is envisaged for the domestic and export market. With regard to product innovation type, Ghana fits in the classification of a factor-driven economy.

Within the theory of stages of development (Porter et al., 2002), in the *factor-driven* economy, countries compete based on their factor endowments, primarily unskilled labour and natural resources. Companies process and sell basic products or commodities, with their low productivity reflected in low wages. Most of the innovation concerns the development of new products enabling access to new (export) markets. Being in pursuit of high-quality products contrasts with the general idea in Ghana that local products are of poor quality.

As a country becomes more competitive, productivity will increase and wages will rise with the advancing development. Countries will then move into the *efficiency-driven* stage. This is not yet the case in Ghana. There was no innovation aimed at increasing productivity by saving on input or labour costs. In the efficiency-driven stage, companies begin to develop more efficient production processes and increase product quality even more because wages have risen and they cannot increase prices. Interestingly, the introduction of new technologies in the Ghanaian cases was aimed at enabling production of higher quality products and access to new (international) markets. Most interviewed SMEs expected to hire more staff in this process of expansion. Most of the entrepreneurs demonstrated social awareness and see their importance in the community.

Finally, as countries move into the *innovation-driven* stage, wages will have risen by so much that companies are only able to sustain these higher wages and the associated standard of living if their businesses are able to compete with new and unique products. This is definitely not the case in Ghana.

In the cases, ideas for new products are mainly acquired from the market. Customers come with requests and suggestions, or the owners talk with clients. This is demand-driven innovation. However, this was not the case for the software developer, which previously developed software meeting a set of requirements and specifications to order. The company now does its own design with the Africa's Legends products. This is an example of supplier-driven innovation.

Internal capabilities

In all cases, it was the owner who initiated, coordinated and managed the innovation process, including preparations for the innovation, the technical details, and the product launch. None of the companies has an R&D department within the firm. In all cases, the owner took up ideas from various sources. Most of the owners who are engaged in export gained international exposure by working or studying abroad. Contacts with clients and competitors at trade fairs in Ghana and overseas, as well as internet research, provided good sources of information on new technology and products.

Sometimes the employees provide additional ideas, to a greater or lesser extent. Several owners, however, stress the limited creativity of their workers and refer to a bad attitude and lack of responsibility. Most owners and managers do train the employees on-the-job, but this does not involve the development of creativity. In fact, it was a frequent occurrence that after training, employees would leave the company for another job. Although there is a lot of unemployment and hidden employment in Ghana (Baah–Boateng, 2013), recruiting

skilled labourers is a problem for all companies. Graduate employees only possess theoretical knowledge and have few practical skills.

Several owners pay their employees based on output, not a fixed salary. In addition, the workers get rewards and bonuses in most companies, although the actual implementation is not always well managed. One owner had a particular reward system to improve worker attendance: those who came to work from Monday to Saturday were also paid for their free Sunday. If they were absent one day, they were not paid for the Sunday.

Typically the companies possess machinery that is old and outdated, often purchased second-hand from Europe or China. The owners often have plenty of ideas and are well informed about the technological possibilities though the internet or friends or via a member of an association. However, they lack funds for the investment (see below).

Business system

All SME owners indicate that the business environment in Ghana is challenging. A key problem is the competition with imports, particularly from China. The policy framework is in conflict with the interests of the local SMEs: there are certain tax exemptions for imported finished products from China, but Ghanaian SMEs importing raw materials or packaged materials from abroad have to pay full import taxes for these materials, resulting in a decreased competitiveness of Ghanaian firms.

There is very little spill-over of technology as a result of cooperation between firms, subcontracting or other forms of collaboration within value chains. One company even acknowledges the downside of unreliable suppliers and avoids cooperation by organising all the steps of the production process within the company.

External business environment: formal and informal institutions

All SME owners have more or less the same negative perception of government policies, legal regulations and systems. The government apparently promises a lot but actually implements little. Many owners do not really believe in enforcement of trade mark protection, although they have registered one. They do not feel supported at all by the government, and feel that they have to survive on their own. The infrastructure is not well managed. All the entrepreneurs complain about constant electricity cuts. Some were able to install generators, but this is not an option for some, given the high costs of petrol.

The banking system is not an attractive source of finance for SMEs, and very few have secured credit. They all complain about high interest rates and complex paperwork. Instead, most SME entrepreneurs are funded from their own savings, family members, friends, or informal institutions, and invest step by step as a result of large orders.

Many interviewees said that they did not have access to credit. One entrepreneur did not want to seek credit because of his belief – *"from a Catholic perspective, you should not have debts".*

Interaction with technology institutions is virtually non-existent. Many SMEs indicated that they would like to cooperate with universities to do research at their premises, while sharing the research insights obtained.

4.2 Policy issues – insights to consider by policy makers

The cases confirm the picture that SMEs, the 'missing middle', are weak in Africa because of the very difficult business conditions, which include time-consuming official procedures, poor infrastructure, inefficient legal systems, inadequate financial systems and unattractive tax regimes. Many firms stay micro and informal and use simple technology that does not require great use of the formal institutional context. Their smallness also protects them from legal proceedings, so they can be more flexible in uncertain business conditions. At the other end, large firms have the means to overcome legal and financial obstacles, since they have more negotiating power and often good contacts to help them get preferential treatment. They depend less on the local economy because they have access to foreign finance, technology and markets, especially if they are subsidiaries of bigger companies. They can also more easily make up for inadequate public services[3].

As argued in the introduction of this report, it is desirable to develop innovation within manufacturing SMEs. Some believe that technological innovation is decisive for SME development and catch-up. Technological innovation has, however, been traditionally concentrated in a few developed countries, given the costs and risks involved in stimulating technological innovation. Foreign sources of technology account for a large part of productivity growth in most countries, as witnessed in the Ghanaian cases. Therefore the development process in low income countries (LICs) could be supported by tapping existing knowledge and know-how.

It seems that the notion of growth as 'manna from heaven' as reflected in convergence theory, see the exogenous growth model of Solow and Swan (1956), might work because of the free and widespread access to knowledge and technologies via the internet. The institutional context, providing trust, predictability, stability and access to finance is more of a problem in preventing 'convergence' from happening.

So then how can the innovative capacity of SMEs in developing countries be increased? According to the World Bank, an efficient innovation policy by governments will address the overall innovation climate, which goes far beyond traditional science and technology policy. At the same time, government action can usefully focus on a few generic functions to help SMEs to grow. It can facilitate the articulation and implementation of innovative initiatives, since innovators need basic technical, financial, and other support.

The government can reduce obstacles to innovation in competition and in regulatory and legal frameworks. Government-sponsored research and development structures can respond to the needs and demands of surrounding communities. And finally, the educational system can help form a receptive and creative population. Regarding actual innovation policy development, there has been a considerable amount of work in developing countries, such as the World Bank (2010) report '*Innovation Policy: A Guide for Developing Countries'.*

The lack of relevant education is a problem for the companies interviewed, who feel there are insufficient skilled workers and operators to work with modern machines. SME owners and managers complain that university and college graduates do not have the required technical and craftsman's skills, exposure to modern technologies, or an entrepreneurial and creative attitude. One entrepreneur specifically suggested creating establishments that train workers in the use of latest technology. The enterprises could employ these skilled workers and give the owners the confidence to purchase new equipment and machinery.

As mentioned earlier, several ministries and agencies are engaged in efforts to develop and promote innovation policy, usually labelled as Science, Technology and Innovation (STI) policy. Despite considerable effort in developing strategies and plans, actual implementation is challenging, due to the limited availability of public budgets and knowledgeable staff. The stories and experiences of the owners and managers raise the

[3] http://www.evancarmichael.com/African-Accounts/1693/SMEs-in-Africa-the-Missing-Middle.html

issue of whether an STI approach would match the realities of the manufacturing SMEs on the ground. Most of the required technology was already available, but elsewhere in the world. Without too much difficulty, the owners and managers found the technology themselves by drawing on various sources of information (the internet, informal business contacts and trade fairs). Moreover, the companies themselves refined and adapted the existing technology once acquired. So, although setting up technology development projects and programmes may help SMEs, it is not perceived as a barrier to innovation by the owners and managers.

Several SME owners and managers suggested that creating a stable and predictable institutional context would be an efficient and effective way to promote innovation in Ghana. All kinds of innovation policies and programmes could be developed, but the results of such policies will be undermined by the weak and unreliable wider formal institutional context.

Another policy idea emerging from the DFID project is that several owners and managers suggested not to focus on governmental policy makers only, but on direct advice to SMEs on how to improve their business. One idea is to develop non-governmental business information exchange networks and platforms, establishing contact between entrepreneurs in Africa and beyond, to facilitate discussion and deals within the various sectors. SME owners suggested that the DFID project could establish a network of all SME owners and managers contacted during the implementation of EIP-LIC and create a website for them to stay in touch with each other.

4.3 Research issues - insights to address the research questions

Theme 1 'Innovation Systems'

In reviewing the innovations in the cases against innovation systems theory, one would expect that the SMEs would be surrounded by a *network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies* (Freeman, 1987). However, it appears that the Ghanaian SME innovations are mostly in-house activities. The cases suggest several firm-level factors playing a critical role in the engagement of innovative activities. The innovation process was initiated, managed and owned by the company without any external involvement or support from other businesses. It is the owners who develop ideas for innovation, with employees playing only a limited part by suggesting improvements at the operational level. Most owners and managers indicate that limited creativity and commitment and decreasing appreciation for craftsmanship and skilled labour by young people in Ghana are obstacles at the firm level.

By contrast, the motivation, contacts and international exposure of the owner were key factors in the engagement in innovative activities. Moreover, the availability of funds as a result of profits was essential. Regarding the risk-taking of their innovation projects, most owners and managers are confident about the market opportunities in Ghana, the region and beyond.

There were no cases of collaborative innovative activities. Although the companies are open to sharing information about their needs, most of the owners/managers avoid cooperation with other companies.

Regarding the external network, none of the cases has been involved in collaborative innovative activities or joint technology acquisition with other businesses or with technology institutions. There were no spill-overs as a result of subcontracts or clustering of firms. Likewise, no company enjoyed the spill-over of technology from larger, foreign or other technologically more advanced firms. There were no examples of large foreign enterprises subcontracting and making technology available to SMEs or exchanging information. The companies in Accra and Tema were very scattered and seem to have had no relationship with each other.

There are virtually no links between the interviewed SMEs and public sector actors, such as universities, governments, or NGOs, as presented in the 'Innovation Systems' analytical model. The so-called innovation system, as a co-evolutionary network of actors (lecture definition) did not exist. Instead, the business system actors and informal institutions play a key role in providing information, technology, credit and overall stability and predictability. The role of these actors could be further explored in EIP-LIC research, with particular regard to the DUI approach in learning and innovation processes, as suggested by Lundvall et al. (2009).

The outcomes of the qualitative inquiry suggest that technology and underlying knowledge may not be the problem. Regarding the diffusion of technology, most of the entrepreneurs were well-informed about technological possibilities and were able to import the technology by themselves with little difficulty, provided funds were available. For most of the technical problems faced by the SMEs, there was already a technical solution developed somewhere in the world, so there was little need to develop local 'new to the world' technologies. There is therefore little need for intermediaries to bring producers and users of innovation/knowledge together. There are few 'breakthrough' technologies that could be disseminated on a wider scale, and the owners and managers seek to meet their specific needs with available technology. They can identify where to source the technology and have suppliers. In some cases, a local technician can make a copy of the machine. There is little local innovation for local problems.

Regarding risk taking in the process of innovation, most company owners report that government institutions bring more uncertainty than stability and predictability. According to the owners, the most critical barrier to innovation is the weak formal institutional context. Research could investigate the adverse impacts on innovativeness of weak formal institutions, a context which may wipe out the impacts of specific and explicit innovation or polices or programmes.

Theme 2 'Finance for Productivity Growth'

Finance is considered a critical constraint by most interviewed companies. In all companies, the owners aim to introduce new products and raise productivity because they see business opportunities in doing so. Learning and acquiring the technology is not a problem. Many entrepreneurs are ready to invest in machines they have identified from internet research, informal networks and fairs. SME owners develop their business with small investment, step by step. They do not take a leap and make a large scale investment. Although there are well developed ideas for innovation and there is confidence in the market, investments are put on hold because of limited access to credit. Instead, the SME owners invest by using the profit of larger orders they have, or by using the contract upfront to get supplier's credit.

The Ghanaian cases provided some insights into the formal and informal financial institutions. One key issue is that banks charge high interest rates for loans to manufacturing SMEs, which prevented several companies from investing in technology that could enable them to increase the speed of production and broaden the range of products. Although they are 'proven' entrepreneurs of registered businesses, able to assess risk and handle a difficult business environment, they were not considered creditworthy. Most of the interviewed companies were given informal loans and gifts by family and friends. Another channel was through informal money lenders, who are flexible but demand even higher interest rates than the banks.

With regard to managerial practices and innovation decisions, many entrepreneurs do little in terms of in-depth calculations and forecasts. Most owners are self-made entrepreneurs, due to a combination of their limited knowledge of financial management and the uncertain and fast-changing economic and institutional context. It is very difficult to make a financial forecast in the Ghanaian context, as the regulations are unclear and change continually. Sometimes these regulations are enforced and sometimes not, and it is unpredictable when government officials will visit. Managerial decisions concerning finance are very ad hoc.

Unlike, M-Pesa in Kenya, SMEs in Ghana do not use mobile banking for business transactions, although most company owners do see its advantages. SME owners have no access to these services and are reluctant to use mobile banking because of security weaknesses.

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Annexes

Annex 1: List of questions for semi-structured interviews

A. BASIC INFORMATION

1. Name of business and owner, location, legal status, years of operation, types of products, manufacturing subsector, productive activities, number of employees, management structure, some indication of turnover and profit and average investment size.

2. Short history and background of business model. How is the company generating value? Position in a value chain if applicable, suppliers, major clients/markets.

3. Did the company grow/expand in recent years? To what extent (why) does the owner consider his/her company as an innovative company as compared to other manufacturing SMEs in Ghana?

4. Did the company itself introduce a new product, process or technology to raise productivity or to face competition? Provide examples of product/process/technology innovations that enabled survival/growth/ expansion in the past 3 years.

B. INNOVATION

<u>New</u>

1. Description of the type of innovation (process, product, incremental, radical). What is new? Did some innovations enable/trigger other types of innovation within the company? Management innovation in terms of goal setting?
2. Is the innovation 'new to the world' involving inventions by internal R&D, or is it a copy, adaptation or adoption of an existing product or technology?
3. How does the owner, employees, clients and others actors perceive the newness? (just a small improvement or as a 'breakthrough')?

<u>Process</u>

4. Idea: Where did the idea and motivation for the innovation come from? What were the first steps in the idea formulation and who initiated these? What was difficult and what was easy?
5. Testing: What were the subsequent steps in testing? At what point in time did it become clear that the new product or process would become a success? On what basis did the owners decide to further implement/commercialise it? Did the owner try new things that failed?
6. Commercialisation: what were the steps towards the implementation? What confidence/trust provided back-up? What was difficult and what was helpful?

<u>Value</u>

7. How do product/process/technology innovations create value for the company?
8. Did the innovation increase productivity, if so how? (lowering production costs per unit, labour/capital input)?
9. Did the competitive position change as a result of the innovation, if so how? (via premium products, better, newer fashionable products and new export markets)?

C. INTERNAL CAPABILITIES (FIRM LEVEL CONDITIONS)

What are the internal strengths and weaknesses with regard to the innovativeness of the company?

Dynamic capabilities

Sensing and shaping opportunities for product/process/technology innovations

1. To what extent do you (and the employees) see the need/urgency to be innovative?
2. How do you or your employees identify new business/innovation opportunities?
3. Who is actively involved in identifying these opportunities?
4. How is raising productivity and competitiveness linked to identifying opportunities for innovation?
5. How do you target a new market segment? How do you consider the competitiveness of your company?
6. How is your company adjusting to customer needs?
7. How does the company select the ideas that it is willing to invest/innovate in?
8. Who is involved in this process?

Reconfiguration of the company

9. How do you adjust by being innovative to the surrounding business environment?
10. How do you share knowledge within your company?
11. How are employees informed about new developments?
12. How does your company train employees to adjust to new developments?

Goal setting

13. Do you have an implicit or explicit goal setting system to improve performance?
14. How do you pay employees for performance? (more salary, rewards)
15. How to you increase motivation? Is there intrinsic motivation (ambition, ownership) and external (money) motivation?

Slack time

16. Do you give employees time to develop or try out a new approach or develop new ideas about products or services, or business processes?

    If yes:

    - What exactly was expected from employees during this time? What kind of activities should employees undertake during this time?
    - Did all the employees get some time or was it restricted to a specific group; and if so, which group?
    - Why did this establishment give employees this time? What was the goal/idea behind it?

    If no:

    Have you ever considered giving employees some time to develop new ideas? If yes, what was the reason for implementing it? If not, why not?

D. FORMAL INSTITUTIONS

How does the owner perceive the opportunities and threats for product/process/technology innovations of the surrounding business, policy and regulatory context in Ghana?

1. Is the owner aware of governmental policies/programmes in Ghana that specifically aim to stimulate product/process/technology innovations in manufacturing SMEs? What is the owner's idea and perception of these governmental policies (programmes/projects)?

2. Does the company actively participate in, or benefit from, such governmental policies/programmes/regulations? (specify in what ways these stimulate the company's innovativeness)

3. What role do intellectual property rights and patent laws play in your innovation activities? Does the owner aim to patent innovations? If so, which patent office is used? Does the owner find intellectual property rights and patent laws helpful for innovation activities? Does the owner respect the intellectual property rights of others when innovating? If not, why not?

4. Are other generic governmental policies/programmes (not explicitly aimed at promoting innovation, stimulating education or providing access to finance) supporting the company's innovativeness in an effective way?

5. Do certain governmental policies or regulations prevent the owner from introducing and investing in innovation? What threats in terms of policy and government regulations emerged in the innovation process?

6. Does the company participate in, or benefit from, programmes or projects stimulating innovativeness run by NGOs and/or international development agencies? (kind of programmes/projects and impact)

7. How does the owner acquire knowledge and technology for product/process/technology innovations? When conducting innovative activities, does the company collaborate with formal bodies, such as universities, R&D centres, research institutes and so on? Why (not)? Which kind of organisation? Does the owner encounter any difficulties in collaborating with such organisations? If so, of what kind? Are these collaborations ultimately beneficial for innovativeness? If not, why not?

E. BUSINESS SYSTEM, SPILLOVERS, EXPORTS

To what extent (and how) are contacts and interactions with other businesses - local, national and international - important for stimulating product/process/technology innovations within the company? Examples?

Business systems interaction

1. Has the company ever introduced a new product/process/technology to suit the needs of a local client/buyer? If yes, did the client/buyer help in any way to make these changes?

2. Has the company ever followed the advice of a supplier in introducing a new product/process/technology?

3. Does the company have active business cooperation (subcontracts)? What is the nature of the cooperation and what is the benefit? Did that involve a new product/process/technology?

4. Does the company buy from or sell to any multinational firms located in Ghana? If yes, has the company ever benefitted in any way from cooperation with these firms to develop a product or improve production techniques?

5. Where does the company typically recruit employees? Has the company ever recruited employees from a client, supplier or competitor? Were these employees particularly helpful in improving products or production techniques? Has the company recruited employees with the explicit aim of improving products or production techniques? Where did they work before?

Location

6. How long has the company been located at the present address? Did the company move to this address or was it created at this address? What were the main reasons why the company was moved to/founded at the present address?

7. How does the presence in the location/region affect the company's performance, innovation, growth? What is the owners' perception of the dynamics of the present location/region with regard to the businesses around (micro, SMEs, large, multinational)? What is the size of the region to which the owner refers?

8. Are the other businesses in the region similar or different in terms of size, production, sector and type? To what extent do firms produce comparable goods in the region (DEFINE)?

9. Alternatively, to what extent are these other business hindering and competing? Does the owner see them mostly as competitors? Does that imply a need for innovation?

10. Does the company buy inputs (what, quantity) from firms located in the region (DEFINE)? What is the quality of local inputs? Did the owners ever ask a local supplier to change a product to suit certain needs? If yes, did the company help the supplier make these changes in any way?

Export

11. Has the company ever exported some of its products to foreign countries? If yes, when was the first export? Has the company exported some of its output abroad in the last year? To which countries?

12. What was the main driver of the company's decision to export? Did the company actively look for foreign clients? Did foreign clients or a wholesaler contact the company (if yes how: website, fair, etc.)? How did the company hear about export opportunities or has the company ever been recommended to foreign clients? If the company was contacted or recommended, why was this the case?

13. Has the company ever improved an existing product or created a new product with the explicit aim of exporting it? If yes, was it at the direct request of foreign clients or to find new foreign clients? Did the company make improvements to comply with standards and regulations?

F. INFORMAL INSTITUTIONS

1. Family and friends (overseas)
2. Cultural perception of innovation. Is innovation something good? Or should we strive for stability and harmony in society?
3. Informal think tanks, informal knowledge through contacts with university experts
4. Rent seeking individuals, corruption
5. Hindering culture, traditions or customs
6. Social learning, collective learning
7. Community solidarity, craft traditions

Annex 2: List of companies interviewed

SMEs interviewed in Greater Accra and Tema in chronological order (20 -30 September 2015)

Subsector		**# of employees**	**Products**
1. Food processing	Accra	2	Cooked mushrooms
2. Textiles	Accra	25	Uniforms
3. Metal workshop	Accra	8	Containers and metal equipment
4. Textiles	Accra	8	Tailor made clothes
5. Food processing	Tema	20 (+15 occasional)	Fufu flour (plantain taste)
6. Food processing	Greater Accra	110	Palm oil processing
7. Agriculture products processing	Accra	10	Poultry feed
8. Food processing	Greater Accra	12	Yam chips
9. Printing and publishing	Greater Accra	40	School books
10. Wood products and furniture	Accra	52	Utility design craft
11. Food processing	Tema	15 (+ 10)	Chili/pepper saus (shico), peanut butter
12. Food processing	Tema	12	Chili pepper powder
13. Engineering metal	Tema	32 (+)	agri processing machines
14. Creative industries	Accra	6	Video games and game software
15. Personal care product	Greater Accra	8	Toilet paper
16. Health care products	Greater Accra	120	Soap, detergents, desinfectants
17. Metal and engineering	Accra	50	Agri-processing machines

Annex 3: DFID research questions

The DFID research project takes an 'economics' perspective on innovation, and involves econometric analysis of a set of variables concerning barriers at firm, regional and national levels and their causalities with the *innovative behaviour/capability of entrepreneurs* and subsequently innovation and productivity. This constitutes a reductionist and deductive approach in defining variables for analysis in which the impact of individual factors on innovation is assessed by applying quantitative econometric methods (ceteris paribus). The DFID project key research questions are grouped under two themes:

Theme 1 'Innovation Systems':

- What firm-level and regional-level factors hinder or foster the engagement of firms in innovative activities?
- What is the impact of in-house innovation activities versus collaborative innovative activities or technology acquisition activities on the innovative performance of firms in developing countries?
- What is the role of economic spillovers within clusters of firms in fostering economic growth and innovation?
- What are the most critical barriers to the process of innovation and the diffusion of technology in low income country settings?
- What types of links between the public/private sectors, universities, governments, NGOs and the private sector are more conducive to innovation activity?
- What is the role of intermediaries to bring producers and users of innovation/knowledge together?

Theme 2 'Finance for Productivity Growth':

- How does the design of formal and informal financial institutions affect firm productivity dispersion across SMEs?
- What are the firm level margins that make finance matter for productivity?
- What role do observable managerial decisions (e.g. managerial practices, innovation, product market competition, product quality, technology adoption, location of the plant and the trade status) and managerial characteristics (e.g. gender, age, education, behavioural aspects) play in explaining the nexus between financial development and firm productivity?
- How does firms' productivity respond to exogenous developments in the financial environment?
- What are the macroeconomic implications of such development experiences?